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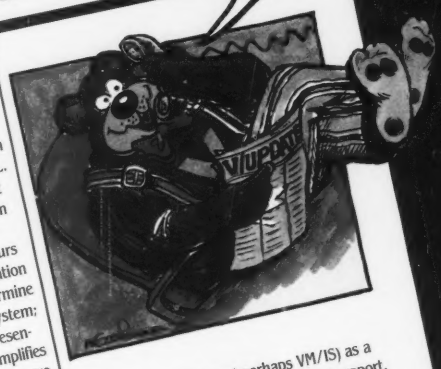

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in focus

MIS, INFO CENTERS CLOSE THE BREACH

Information centers can split an organization's MIS setup by forming two disjointed information systems environments — one for end users and another for DP professionals. MIS can bring these two factions together by cultivating the best qualities of each group to establish a single, corporatewide information systems strategy. By Vaughan Merlyn. Page 12.

END USERS NEED NOT APPLY

Where do the career paths of information center employees lead? Rarely into MIS, experts agree. Find out why info center personnel find it hard to make the leap to information systems professionals. By Stan Kolodziej. Page 25.

IDENTITY CRISIS

The primary goal of the information center remains the same, namely, to give end users the necessary skills and tools to take advantage of the power of computing. However, a recent survey found that info centers are undergoing changes in the benefits they provide, the obstacles they must face and the scope of their power. Can they pass from adolescence to maturity? By Beatrice Garcia. Page 15.

Control up for grabs

By Stan Kolodziej. The relationship between information centers and MIS is sometimes a stormy one. The centers' increasingly independent attitude, their ability to gain the ear of top management and their financial savvy have combined to make these end-user strongholds a challenge to the old guard of MIS. Page 17.

Organized along new lines

By Theodore Klein. The success of information centers will inevitably lead to their extinction, some industry watchers claim. The author analyzes how the information centers of today are forming the basis for an inevitable move to distributed, departmental processing. Page 27.

Coping with applications

By Rebecca Hurst. Most information center managers agree that info centers cannot continue to juggle end-user application development and support if they are to remain effective. Read about how some centers are dealing with applications backlogs, once thought of as primarily an MIS problem. Page 31.

Perils of desktop publishing

By Rebecca Hurst. End users are increasingly clamoring for desktop publishing capabilities. Find out how to choose among the large number of products and how to overcome problems such as desktop publishing education, quality standards and management control. Page 35.

SPECIAL SECTION

Training

Training is still considered the primary function of most information centers. The market for training tools has blossomed and ranges from one-on-one instruction to highly automated and customized methods. Let Features Editor Michael Tucker show you what products and services are out there so you can get the most for your money. Section begins on page 21.

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Analyst: Info centers should downplay their training role. Page 4.

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Jim Young on who should be in charge of the information center. Page 4.

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Information center distribution in mainframe sites. Page 44.

COVER BY MARTIN STEIN/VISUAL CONSPIRACY

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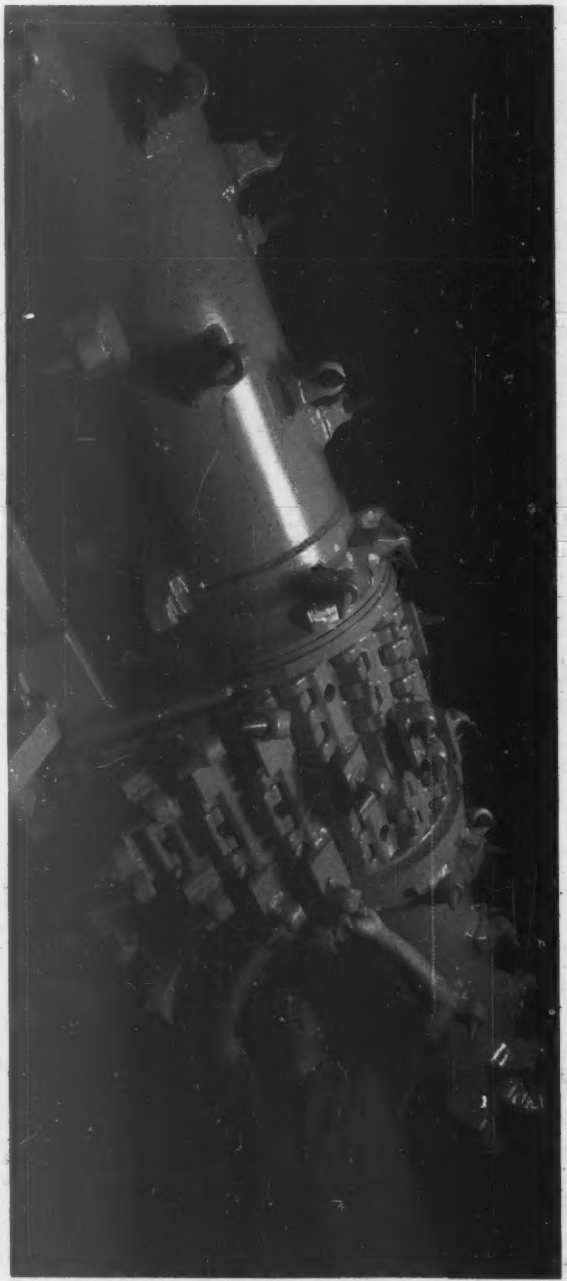

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Second-class postage paid at Framingham, MA, and additional mailing offices.

Computerworld (ISSN 0010-4841) is published weekly, except: January (5 issues), February (5 issues), March (6 issues), April (5 issues), May (5 issues), June (6 issues), July (5 issues), August (6 issues), September (6 issues), October (5 issues), November (7 issues), December (4 issues) and a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171.
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FROM THE EDITOR

Survival of the fittest

Information centers have come a long way, mostly because end users have come a long way. It is not easy to keep up with, let alone stay ahead of, the changing needs of end users. While it may be extreme to state that today's info center must evolve or die, for many their main concern has, in fact, become a matter of corporate survival.

The growth of new information centers has slowed considerably as they have saturated the companies in need of them. And in the existing centers, users — from beginners to sophisticated power users and everyone in between — are demanding a wider range of assistance. Info centers are running into the very same problems that besieged MIS and prompted the formation of these centers in the first place — applications backlogs, escalating user demands and insufficient staff and resources. And as their roles become more wide-ranging and complex, centers are being called on to cost-justify their existence; however, the task of increasing productivity is a hard thing to quantify.

Cost-justification may be the least of the problems, however. A tug-of-war over resource control and influence is occurring among info center staff, MIS and end users. Most info center staff report to MIS but are trying to become more independent. However, MIS, which initially relinquished the control of personal computers with relief and disdain, is now realizing it made a mistake. PC systems and end users have become an integral part of many firms' integrated information systems. To create one world of end-user computing and another world of MIS computing is futile and inefficient. The information center should act as the liaison bringing these two entities closer together rather than splitting them further apart. In today's chaotic business place, info center managers and staff need to work with MIS, rather than against it, for the good of the organization.

IN THIS ISSUE of *CW Focus*, we look at the info center in terms of technology, the growing backlog dilemma, organizational changes and the center's current and future role. We analyze the political forces at work as well as the career opportunities that exist within the MIS/info center infrastructure. And our Special Section focuses on what most info centers do best — training. With the right blend of management knowledge and backing, information centers in some form or another can continue to play an integral part in any successful company.

Ann Dooley

'OS/3' operating system may already be on the market

LETTERS TO THE EDITOR

Your August 12 personal computer issue that concentrated on IBM's Personal System/2 and OS/2 considerations was timely, interesting and informative. However, all of the writers overlooked an important point.

The distant, yet sorely needed "OS/3" operating system that *CW Focus* columnist Thomas Roberts mentioned in The Insider is actually already here. It's called PC/MOS 386 and is produced by the Software Link Co.

PC/MOS 386 is a multiuser, multitasking, Microsoft Corp. MS-DOS-compatible operating system that fully exploits the addressing advantages that the Intel Corp. 80386 micro chip has over the Intel 80286.

The PC/MOS product is destined to become an industry standard business operating system because many of the truly sophisticated user applications that will be written in the near future will not be able to run on the 286's archaic 64K-byte segmented architecture.

In the column, Roberts correctly pointed out that it will likely be five years before IBM or Microsoft could produce such an operating system.

By then, it will be too late.

Garland Favorito
Data Processing Application Consultants
Norcross, Ga.

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I find your magazine interesting. I have noticed that IDG Communications, Inc. also publishes a newsletter called "IBM Watch" of which columnist Deidre Depke is editor.

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New York

[Interested subscribers can contact Deidre Depke at Boston-based IDG News Service by calling 617-423-9030 — Ed.]

By any other name, it's still Data-Xpert

I enjoyed reading the article, "It's a dirty job, but someone's got to do maintenance," in the July 8 issue of *Computerworld Focus*.

While we at XA Systems Corp. appreciate your inclusion of our product in the article, we would like to point out that the name of our data manipulation software product is Data-Xpert. The article merely referred to the product as Xpert.

Our series of products is sometimes referred to as the Xpert series, but each product has an individual name: Data-Xpert, Test-Xpert and IMS-Xpert.

Susan R. Morgan
Manager, Product Marketing
XA Systems Corp.
Los Gatos, Calif.

Q AND A

Shaku Atre

Long considered training specialists, info centers must branch out to stay vibrant

Not everyone is pleased with the growing link between training and information centers. Shaku Atre is one such person. Atre is president of Rye, N.Y.-based Atre International Consultants, Inc., a company that provides consulting and training in data base use and information center administration. She has written a book on information centers entitled *Information Center: Strategies and Case Studies.*

Atre recently spoke with *Computerworld Focus* Features Editor Michael Tucker on why she said she believes information centers may not survive an end-user training connection.

What is wrong with training?

A few years ago, I pointed out that information centers were gravitating toward micros and toward micro-based training as their major mission. I believe that's dangerous because training is hard to show in terms of real dollars. People tend to think of training as something that is necessary but . . . nothing more than an expense. [That is, it doesn't yield income in its own right.]

So, if info center people think of their main mission in life as training, information centers could become training backwaters. Eventually, they would be absorbed either by corporate training departments or human resource departments.

What should info center managers do instead?

Information center people should think of themselves as a business within a business. You see, information centers aren't trendy anymore. And just starting a center for the sake of starting it, well, let's just say those days are gone. Information centers have to prove they're bringing in more money than they're spending.

Info centers have to prove they are profit centers instead of cost centers. To do that, they should get involved with a number of new technologies — connectivity, for instance. Info center managers could become responsible for linking some of the corporate personal computers with the mainframe or departmental computer.

Let me note that I would be the last person to suggest that every single microcomputer should be connected to every other single microcomputer. There are places where you want stand-alone systems. You don't want to lose the spirit of experimentation that made micros take off in the first place.

What other technologies should information centers explore?

Information center people should develop expertise in decision support systems. Most companies have already automated their bread-and-butter applications, such as payroll and accounts payable. What they have not done is set up systems that can give a real strategic advantage to executives by allowing them to make a decision in two hours instead of two weeks.

Are you saying that information center people should become responsible for executive information systems?

Right. And they should also get into data administration. Now is the time for information centers to prove they're worth the expense.

I think information centers should be proactive rather than reactive. They get so they are just fighting fires, when they ought to be initiating action.

To do that, info center managers ought to be out exploring new technologies — particularly expert systems — because they really are the mediators between MIS people, who have the computer tools, and end users, who have the business expertise.

Information center managers ought to be able to put those two groups together for synergistic results, which means, by the way, that information center managers have to develop both business skills and technical skills. They've got to learn about technology. You see, many info center people didn't pay much attention to developing technical skills. They were mostly people-oriented. But to be taken seriously by MIS, they have got to have technical skills.

What else would you like to see happen regarding information centers?

We must do something about the career paths of info center managers. Top-level management has not created any career path for info center people, and I consider that the one big organizational problem of information centers. If there is no career path, all the interesting people will not be interested in information centers.

After all, what is a center manager supposed to do after three years? Go to MIS? Go to human resources? [The path] is not clear. Personally, I suggest that these people could go to user departments as managers. After their time at an information center, they'd know not only user needs but the technology as well. I think they'd be in an ideal position to put the two together.

But, however it is solved, the problem of the career path must be dealt with soon. People want to know what they're going to do with their lives.

What's the future? What will happen to information centers?

I see three possibilities. If information centers can shift to end-user computing, it's possible that info center people will end up in charge of that — in charge, that is, of decentralized end-user computing.

Or, perhaps, information centers will evolve into some kind of research and development role in which they develop applications for end users.

Or, finally, if they concentrate on training, information centers will be absorbed by training or human resource departments.

MANAGER'S CORNER

Who reports to whom

Jim Young

Companies considering a first-time information center implementation should pause to consider the reporting structure it should put in place. Even those firms that already have successful information center operations may want to review who is in charge of the center.

The issue of reporting structure has an impact on the nature of your information center direction. Different companies have varying needs and MIS managers have various areas they want to emphasize in their information center. A reporting structure is one important way to address these differences.

Young is managing director of MIS for the Wheeler Group, a division of Pitney Bowes in Hartford, Conn.

Here are the pros and cons of various info center reporting strategies.

Systems and programming at the helm. If end users make use of information center tools to supplement application systems, then who can better guide that usage than those who built or know the information center systems? These people can make sure that the tools are put to use consistent with the functional application. They also are likely to know and work well with individual functional users.

But application specialists tend to be precise. It is not clear that, given the choice between carefully written and tested code and end-user-driven code, they will always be on the side of expedience. The resulting heavy-handed user guidance may not foster user independence.

Operations in charge. When it comes to measuring and guaranteeing systems availability and performance, the operations department already has established the techniques to deliver these features to diverse users. Help desks offer query and problem resolution support that end users will need. Operations would be in a good position to provide these end-user tools along with other services. Having operations run this area holds strong advantages for information centers that are part of mainframe networks.

Unfortunately, a possible drawback might be operations' reported dislike for spontaneous changes and their even stronger trepidation of the unknown. End-user applications contain these qualities in abundance.

Technical support oversight. If an info center installation plans to use new and evolving technology, then the technical support department has the right set of skills to minimize the disruption caused by high-tech confusion. Having the key talent at hand to install and tailor state-of-the-art technology will ensure correct operation and maximum functionality. On the down side, technical support has never been renown for its teaching and training. Education is a top priority in nearly all information centers.

Data administration on top. A data administrator is the best qualified to supply users with access to important data. The data administration function consistently distributes data and ensures its timeliness, accuracy and even its appropriateness. Data administrators can orchestrate end-user access with application systems usage and can maintain data dictionaries.

However, giving away data so freely may not sit well with the computer security officer. To keep data secure, a company may have to restrict the easy access and impromptu nature of exploratory data analysis.

Office automation department as chief. When it comes to walk-up service, training skills, dealing with variety and putting diverse technology to practical use, the office automation function of most organizations is vastly more experienced than the DP side. The OA area, therefore, may have the lead when it comes to user-friendliness. The OA sector even brings strong functional skills to the table when dealing with electronic mail and document preparation.

However, when it comes to accessing, manipulating, interpreting and using data, the OA area is often as inexperienced as the users it should be helping. Moreover, the OA function has traditionally been stronger at maintaining existing services cost-effectively than implementing strategic programs.

An independent department takes command. Making the information center a separate department allows it to concentrate on the particular areas you determine to be important, such as training, Help functions, data guidance and so on. Moreover, an independent information center will not be burdened with prior allegiances or contradictory responsibilities.

The only disadvantage of this approach might be the distance independence creates. Ideally, end-user computing should function as a smooth extension of basic company systems; applications should mesh, data use should be consistent and the right tools should be put to the right uses. This coherence is unlikely when end-user computing is set up separate from and often in competition with traditional methods. But companies must make room for both.

The organizational issues surrounding information centers are complex. Yet a company should not overlook the ability to bring the various strengths of other departments to the information center through reporting alignment. Once you have studied the options, let the appropriate part of your MIS organization put its best foot forward.

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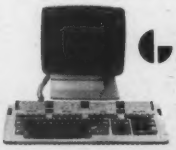

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news & analysis

UPDATE

IBM's software moves

Information center managers should keep an eye on IBM's Applications Systems Division, which is attempting to revamp the company's application software development and become a major producer of quality software in the small- to large-systems arena. Part of the new division's plans apparently includes using IBM's Systems Application Architecture to enable future software applications to run across IBM computer lines.

Not everyone is convinced that IBM can make the transition into the top ranks of software producers, however. "The IBM corporate culture just isn't geared toward producing great software," explains Seymour Merrin, a consultant based in Southport, Conn.

Maybe, but the new division is ambitious, aiming its large research and development guns at the office, computer-integrated manufacturing and financial software fields.

9370s a hit with users; predicted sales on target

IBM has a departmental hit on its hands. The 9370 mid-range systems, which many analysts last year greeted with some indifference, are getting a warm reception from users. Researchers surveying early 9370 shipments and user purchasing plans are now predicting that IBM will indeed sell 15,000 to 30,000 of the departmental systems in 1988, 1989 and 1990, just as Big Blue predicted it would all along.

Purchases of 9370s to date are primarily from the Fortune 500 crowd, which is installing them as pilot machines. Many of these companies will most likely have to develop their own 9370 applications, however, because 9370 software is definitely not one of the system's strong selling points.

And IBM's attempts to bundle its Professional Office System applications with the 9370 departmental machines might not be enough in the way of software support.

Sources say IBM might also use its Federal Systems Division marketing force to attract big commercial deals as well as government and military contracts.

Best deals in micros may be PC AT's bargain prices

In microcomputer news, IBM expanded its Personal System/2 line at both ends (see story page 41). The company unveiled the entry-level PS/2 Model 25, a stripped-down micro that sports an Intel Corp. 8086 processor. But the machine has received a thumbs-down from serious micro users and analysts.

At the top of the line, the company unveiled the PS/2 Model 80-311, which pushes the 32-bit Intel 80386 processor to a speed of 20 MHz, has 2M bytes of on-board memory and is going to leave PC power users gasping for breath.

But while all eyes are focused on the Intel 386-based machines, the real deals might be the bargain-basement IBM Personal Computer AT and compatibles. The AT market is now in a state of price-cutting turmoil. However, don't look for prices to go down much further because sales are already bumping against rock-bottom margins.

"Prices won't be coming down, [but] more features are being built in," explains John Sullivan, vice-president of International Sales and Services at Leading Edge Products, Inc. in Canton, Mass. A case in point is Leading Edge's Model D2 AT-compatible. For $2,000, a buyer gets 640K bytes of main memory expandable to 1M byte, a 1.2M-byte diskette drive, adjustable clock speed to 10 MHz and a 30M-byte hard drive.

Sullivan claims there is still life left in these AT compatibles, at least for another two years, at which time he expects applications for IBM's OS/2 operating system and 386-based sales to finally make a mark.

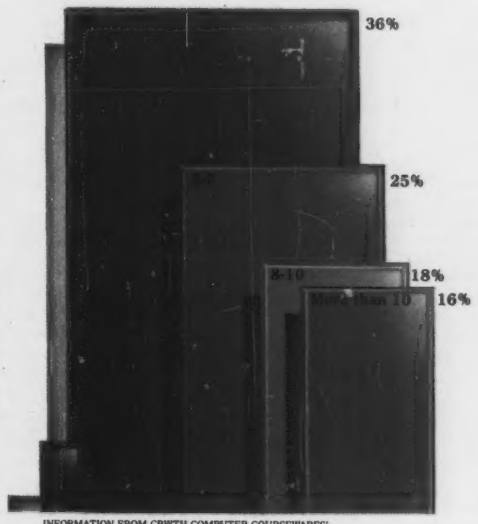
Thomson announces plans for Nomad product line

While Computer Associates International, Inc. was busy digesting Uccel Corp., Paris-based Thomson SA, a high-technology conglomerate, recently bought D&B Computing Services, Inc.'s

Continued on page 8

Sizing it up

Info center staff sizes in 450 Fortune 1,000 and other large organizations



INFORMATION FROM CRWTH COMPUTER COURSEWARES' THIRD ANNUAL CRWTH INFORMATION CENTER SURVEY

GRAPHIC BY BRUCE SANDERS

Confused by copyrights? Future service may help

If you are confused by copy protection and site licensing, help could be on the way.

The Copyright Clearance Center, Inc. (CCC), a Salem, Mass., nonprofit organization, has lately been trying to interest both personal computer users and software vendors in a plan that would implement a broad-based software copy license format and make CCC the copyright middleman between users and vendors.

"Right now we think the situation for most users is confusing when it comes to site-licensing agreements," explains John Garrett, manager of business development at CCC. "Users simply don't have the time or inclination to investigate the site-licensing conditions offered by most vendors. We can act as an information clearinghouse for both sides."

Garrett is also quick to point out, however, that the plan is still in an embryonic stage.

"We've had discussions with some primary user and vendor organizations," he says. "The next step is to go to our [CCC] board of directors and get approval for putting a pilot project in place to see if the software vendors and users out there are really interested."

If that proves positive, Garrett says, the next stage would be to implement the plan, perhaps as early as the spring of 1988.

The CCC plan is modeled after a similar photocopy licensing plan the organization put in place in 1977 at the suggestion of the U.S. Congress. That program, called the Annual Authorizations

Continued on page 8

Rough going for non-IBM-compatible PCs — except for the Mac. Story page 10

Update

Continued from page 7

Nomad fourth-generation language products.

Nomad will be marketed and supported by a new Thomson subsidiary called Must Software International, based in Wilton, Conn.

Not wasting any time, Thomson issued a statement listing immediate plans for Nomad, which included strengthening customer support, expanding the sales force and rapidly enhancing the product line.

Lotus TAC said to link PCs, DB2; may boost IBM DBMS's popularity

Lotus Development Corp. has introduced a release of The Application Connection (TAC) that offers a link between IBM Personal Computers and compatibles and IBM's DB2 relational data base management system, which resides on mainframes.

TAC users reportedly can load the 1-2-3 Connection module on their personal computers, select information stored in DB2, massage it, then return the updated data to the mainframe. All this activity can take place without leaving Lotus's 1-2-3 environment.

Industry watchers said they expect the TAC enhancement will make more people jump on the DB2 bandwagon.

Analyst says SQL, relational tools not needed in corporate computing

Not all data base software news is rosy, according to Kurt Christoff, a senior partner at Information Processing Associates, a Memphis consulting organization.

Christoff claims that the computer industry's move to IBM's SQL relational data base management system retrieval format is a solution looking for a big problem.

"I see [SQL-based] relational data base products exploding, and I see most of these products not meeting user expectations," Christoff says. "SQL is a carrot dangling in front of information center managers. A lot of information center managers have taken the carrot and sold their bosses on SQL. But I think the whole thing is going to rebound on them," he adds.

Christoff's view is that the SQL DBMS product and the whole relational game are simply not needed in corporate computing.

"The problem has never been the technology," according to the consultant. "The problem has always been the failure of information centers and MIS [staff] getting in tune with their companies' business goals. They can do that without SQL," he claims. — SK

dB
By Rich Tennant
FRANKLY, I THINK OUR INFORMATION CENTER IS AN UNTAPPED GOLD MINE.
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Report: Number of info center start-ups on the decline

Information centers were once among the most fashionable computer installations in corporate America. Now, however, some industry observers are suggesting that info centers are falling from favor. Some are even questioning the long-term viability of the whole information center concept.

A recent report from market research firm Computer Intelligence Corp. in La Jolla, Calif., suggests that firms are setting up new info center installations at a much slower rate than they were a few years ago.

The report notes that the number of IBM or compatible mainframe sites that had an information center in place rose from 30% in July 1985 to 37% in July of this year. However, the number of IBM mainframe sites planning a new info center dropped considerably during the same period. In July 1985, 27% of the sites questioned said they were planning an information center; by July 1987, only 8% said they were.

Needs fulfilled

The Computer Intelligence report attributes this decline to a number of factors, not the least of which was that those sites that needed an info center now have one and those that did not never will have one. But the report also suggests that new technologies — notably personal computer networks and IBM's 9370 departmental computer — may have also decreased the need for independent info centers.

Another factor affecting information centers is the changing role of MIS in regard to end-user computing. Increasingly, MIS officers are becoming directly involved with end-user concerns and, in some cases, are removing the need for information centers. MIS personnel are now managing entire executive information systems and PC networks that can provide data and services far more quickly and efficiently than stand-alone PCs can manage.

For example, the MIS department of Massachusetts Mutual Insurance Co., located in Springfield, Mass., has recently begun to train its MIS staff to be consultants to end users and to become active partners in the development of desktop applications.

"We still have an information center," notes Jeff McEwen, associate director of information management training for Massachusetts Mutual, "but what we're trying to do is make information systems responsible for both the mainframe and some info center functions. I think systems can replace some, but not all, of the functions of the info center. I think what information centers do best, for instance, is basic training. But you should not be going to them for applications development."

Key mission in trouble

However, information centers' training role may not be secure. Several professionals in the training community have suggested that their departments could provide basic computer literacy as easily as information centers could.

In fact, some info center managers are finding their operations under attack from human resource and development divisions.

What future, then, do information centers have?

One consultant, Shaku Atre, president of Atre International Consultants, Inc. in Rye, N.Y., suggests that unless info centers can reestablish their link with end-user computing — perhaps by becoming involved with executive information systems — they may cease to exist. — MT

Confused

Continued from page 7

Service, is a licensing program that enables corporate clients to use the CCC group as a conduit for negotiating photocopy licenses with various U.S. publishing companies.

CCC says it plans to provide the same services to corporate software users. For an annual payment, for example, a corporation would be authorized to copy, download, network or make any other internal use of designated software without record keeping, additional payments or multiple agreements. Each software publisher would establish copying prices for software, which would form the basis for the license price. After deducting CCC costs, license fees collected would be transmitted to the publishers of the software included in the license.

Garrett cautions, however, there is still a hard row to hoe.

"There are a lot of legitimate concerns by both parties," he says. "Software vendors want to know what effect the program will have on their revenues and revenue streams. They want to know if the program will eliminate illegal [software] copying. Users want to know if the plan will include software upgrades and documentation. There's still a lot to iron out."

Jon David, one of the directors of New York Personal Computer, Inc., a New York PC users group, says he thinks the CCC plan is a good thing for those corporations that want to be honest.

"But the average firm is going to keep on pirating software. It's a fact of life," David says.

According to Alex Kask, a senior manager at New York-based Ernst & Whinney and a director of the Micro Managers Association, "The CCC plan will help users, and it's a viable alternative to the hassles you have to go through with site-licensing contracts. In our case, getting a licensing agreement through our legal department was a long and frustrating procedure. Eventually, you can begin to take shortcuts, which is not good. Some sort of standardized licensing arrangement is necessary."

Kask adds that it will not be the smaller companies that will concern the big software vendors under the CCC plan.

Lotus won't lose sleep

"The small companies will always copy software illegally," Kask says. "Lotus Development Corp. isn't going to lose sleep over the people with three computers who want to copy its 1-2-3 for the other two. It's the installations with 1,000 machines they worry about, and the CCC plan could help them there."

Garrett says that another touchy issue between software users and vendors will be what to do with the thousands of illegal software copies now circulating in U.S. corporations.

"We don't know what the software vendors will charge for illegal copies already out there," Garrett says. "But we know they just won't ignore them." — SK

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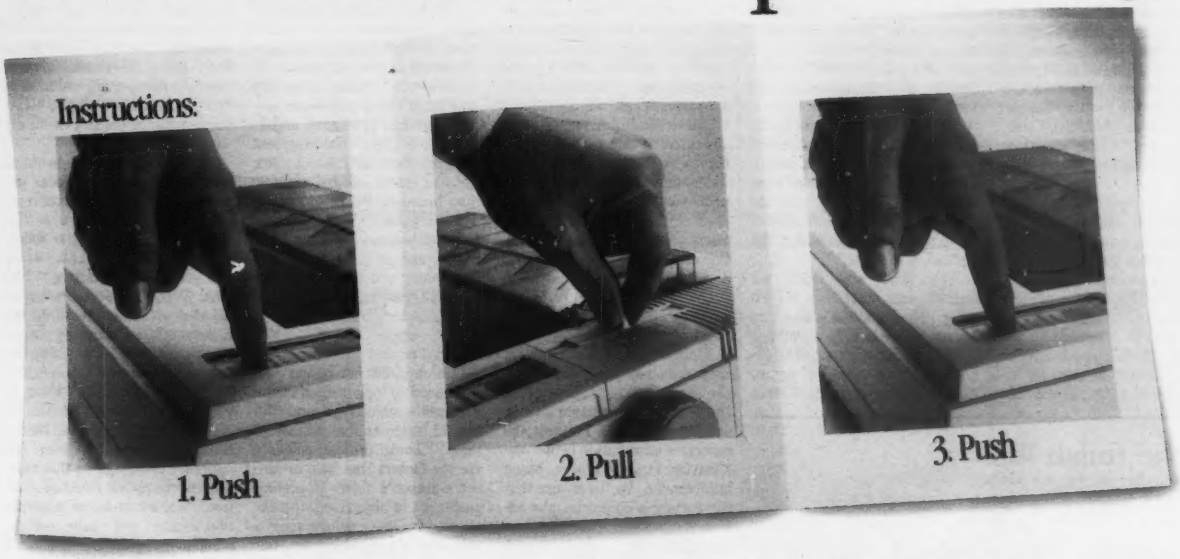

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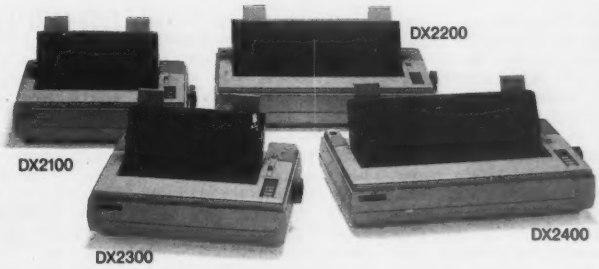

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Noncompatibles in for trouble — except Mac

"A number of organizations have IBM Personal Computers or compatibles and something else," says Jonathan Yarmis, personal computer service research analyst for the Gartner Group, Inc., a Stamford, Conn., research firm. "That something else is most likely an Apple Macintosh."

Apple Computer, Inc., whose computers accounted for 8.8% of the microcomputers shipped to U.S. office environments in 1986, was second only to IBM, which held 35.3% of the market, according to Dataquest, Inc., a San Jose, Calif., research company. Six other companies, each holding market shares of between 3% and 7%, all produce IBM PC-compatible systems (see chart above). The remaining 27.4% market share consists primarily of PC-compatible vendors, Dataquest states.

The trend is clear. Unless the system is a Macintosh, few corporate offices have a place for non-IBM-compatible micros. "Noncompatible PCs are being used in a few specific situations, but these situations are insignificant when you look at the whole market," confirms Seymour Merrin, president of Merrin Resources, Inc., a Southport, Conn., consulting firm.

The amount of non-IBM-compatible systems is probably less than 5% and decreasing, Merrin notes. "Vendors such as Wang Laboratories, Inc. and Digital Equipment Corp. have realized the need for IBM compatibility," he says. At the same time, the Macintosh holds about 10% of the business micro market and is expected to garner a greater percentage in the next year, Yarmis and Merrin agree. "The Macintosh's share could grow to 20% or 25%," Merrin predicts.

A big boost for the Mac came from IBM when it announced the IBM Personal System/2 and OS/2 operating system, the two analysts say. "With the introduction of these products, companies have no choice but to support a multiple-standard environment," Yarmis asserts.

Facing several standards, companies are taking a second look at the Mac. "Users cannot move the boards or disks from their PCs to the PS/2," Merrin explains. "Because users have to make a change, they think, 'Why not look at the Mac?' "

The PS/2 and OS/2 announcements have not helped other noncompatible computers because of the lack of advantages these machines bring to the office, the two analysts agree. Noncompatible computers from vendors such as Atari Corp. and Commodore Business Machines, Inc. have little to offer corporate users, Yarmis says. "These products don't have the base of software, the support or the distribution channels," Merrin concurs. "A company can't afford to be a pioneer with them."

By contrast, "the Macintosh offers capabilities that IBM hopes to provide in the future," Yarmis says. "With Apple's new Hypercard and the Macintosh interface, the Mac has a two-year head start on OS/2 with its Presentation Manager." Additionally, the Macintosh II, which is based on the Motorola, Inc. 68020 processor, is an immensely powerful micro, Merrin notes.

Another advantage of the Macintosh is support. Because Macintosh applications are written to the system's interface, a user who learns one package has learned the basics for using the others. This ease of use becomes an important factor when managers need to leverage scarce resources, Yarmis says. "A manager has to consider that one support person can handle either 10 PC users or 20 Macintosh users," he claims. — RH

At the finish line

1986 market shares for micros in the U.S. office environment

IBM	35.3%
Apple Computer, Inc.	8.8%
Compaq Computer Corp.	6.8%
AT&T	6.2%
Tandy Corp.	5.2%
Zenith Data Systems Corp.	3.8%
Leading Edge Products, Inc.	3.5%
Epson America, Inc.	3.0%
Other	27.4%

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Guiding a needs assessment

How to help managers find out what they need

Ideally, a departmental manager could walk up to the information center and say, "I need a personal computer with 30M bytes of storage, X-brand data base management system and Y-brand spreadsheet." Such managers are rare, though.

More often, managers will come to the info center looking for a way to make their departments more efficient or to solve problems they are having with their current computer systems. Such requests require information center managers to perform a needs assessment study that not only accurately reflects the users' true business needs but also works in practice.

Once a department manager has contacted the info center, the center needs to survey both the department manager and users, advises Carol Longest, an associate information center analyst for Virginia Power, based in Richmond, Va. To ensure that the survey is complete, she advises info center staff to use a questionnaire.

The survey should cover technical information about any existing hardware and applications, Longest claims. Information center analysts should also learn about the department's procedures and products, she recommends.

The survey should also determine a department's commitment to implementing a technology solution, Longest says.

However, relying too heavily on a list of topics may cause several potential problems, argues Stewart Stokes, vice-president of QED Information Sciences, Inc., an education and training firm based in Wellesley, Mass. The categories of questions tend to be either too specific or too vague, and in most cases, the info center and the users apply different meanings to the items on the list, he warns.

Critical probe

Stokes says that info center analysts need to look instead at the manager's objectives and the critical incidents that will affect them. "These critical incidents are the factors that help or hinder a person's ability to accomplish a set of objectives," he explains. Managers usually have a clear idea of their objectives, but information center analysts often need to probe actively for the critical incidents, Stokes notes.

In probing, the info center staff must listen both for spoken and unspoken clues, Stokes advises. "Then, give the manager feedback to draw out what is not being said," he says.

By listening attentively, the information center manager can put together the pieces of information like a mosaic, Stokes explains. "The pieces then become a complete view of a situation." And once info center analysts understand the circumstances, they must be careful not to throw a ready-made solution at the problem, he cautions. "Having a hammer doesn't mean every problem is a nail."

Finally, locating the problem and offering a solution does not end the information center's responsibility, Longest says. "Information centers need to follow up the projects to make sure that the solution is working," she says. Even if the department has decided not to use one of the solutions offered, Longest urges info center analysts to have a follow-up session with managers.

"A manager might want to use one of the solutions six or eight months down the road," Longest explains. However, situations can change in that time and may require a modified solution. "For example, an information center may have recommended using the IBM Personal Computer AT a few months ago," she says. "Since then, IBM has limited the availability of ATs, and the info center now may be recommending IBM Personal System/2s." — RH

For systems success, zero in on users' cognitive styles

To make the best use of computers, "different people should be allowed to work with the computer differently," said Sherry Turkle, keynote speaker at the Fourth Annual Information Center Conference held recently. Turkle, an associate professor in the Program in Science, Technology and Society at MIT, warned that "people are doing damage by saying there is only one right way."

For information center managers, providing effective technology solutions and training means understanding the varied ways in which people learn and work. For example, some people like structured settings and create top-down outlines, Turkle noted. "Others prefer less planning and use a process of association and negotiation," she said.

Different ways of thinking can affect both users' and managers' choices of micros, Turkle noted. When people argue about the merits of the Apple Computer, Inc. Macintosh and the IBM Personal Computer, she said, "they are really defending their cognitive style, not the technology."

As a result, information center managers should consider that the problem is not who is right about the technology "but who works best and is most expressive with a certain type of computer," Turkle explained. Taking the idea a step further, info center managers need to look at the reasons behind their own product choices and realize that what works for them may not work for everyone.

Similarly, information center managers must adjust their teaching methods to respond to users' individual thinking and learning processes. "Too often computer literacy classes communicate that there is only one right way to use the computer," Turkle said. "This masks the fact that the PC is a tool."

To see or not to see

A learning variable for many users is the issue of transparency vs. opacity, in essence, the degree to which computer functions are apparent to the user, Turkle said. "Some people are more comfortable with computer transparency; they want to theoretically trace every line of code down to the machine." Such users need to understand the PC's architecture before they feel comfortable with it.

Other users prefer computer opacity, Turkle noted. They want to work with a computer at the application level and do not want to know what is hidden below the software. In training, information center managers should try to avoid intimidating these users with too many technical details.

Generally, information center managers are going to meet users whose educational demands fall somewhere between the extremes of transparency and opacity, Turkle said. There are no set guidelines for training these users, she explained; instead, information center managers need to look and listen for clues from users that suggest the level of technical detail needed.

The information center's receptiveness to users' training requirements is critical in getting employees to accept the computer as a productivity tool. "Trainers have only 1½ chances to teach people how to use the computer before they decide that they are not good at the computer," Turkle warned. After one bad learning experience, users are reluctant to give trainers a second chance. — RH

Composite languages mix benefits of 3GLs, 4GLs

Information centers may be fostering the development of an entirely new class of programming language that falls between third- and fourth-generation languages.

The traditional purpose of the info center is to make microcomputers accessible to nontechnical end users. Programming languages promoted by information centers have usually not been languages in the classical sense. Rather, they have been user-friendly data base languages, programming environments (such as Lotus Development Corp.'s 1-2-3) or, in some cases, fourth-generation languages.

Recently, however, a new group of languages has appeared on the market. Essentially, they are traditional third-generation languages designed for use by info center personnel in the rapid production of applications for end users. These tools combine some of the flexibility of third-generation languages with some of the user-friendliness of programming environments. Advocates sometimes call these tools "three-and-a-half-generation languages."

One such hybrid

One example of such a language is Clarion from Barrington Systems, Inc. in Pompano Beach, Fla. Clarion, which costs $395 and works with the IBM Personal Computer AT, Personal System/2 and compatibles, is both a data base management system similar to Ashton-Tate Dbase III and a programming language. In fact, Barrington says it regards Dbase III as a major target and this year announced a bridge product that allows Dbase applications to be ported to Clarion.

As a programming language, Clarion resembles a cross between C and Basic. It has, for instance, some of C's flexibility but provides the readability of Basic. The company claims that an accomplished C programmer can learn Clarion and produce applications in a matter of weeks.

What makes Clarion like a fourth-generation language, however, is that it comes with an extensive library of screens, reports and so forth. With these, an info center manager can put together sophisticated applications quickly.

Barrington is, in fact, targeting information centers as its primary market, second only to value-added resellers, according to company President Jerry Duke.

Objective programming is another approach to rapid development. An objective programming language allows the developer to group certain functions into software objects — virtually autonomous programs. Because they allow the reuse of massive chunks of code, objective languages are said to vastly reduce development time from application to application.

Two objective versions of the C language are C++ from AT&T and Objective-C from Productivity Products International, Inc. (PPI) in Sandy Hook, Conn. Of the two, Objective-C may be the most "objective" in that it attempts to make its software objects as much like components as possible. According to some industry observers, Objective-C actually discourages programmers from tinkering with its objects. This may distress some programmers but delight developers who must mass-produce applications efficiently.

Originally, objective programming in any language was the sole domain of sophisticated software shops. But, gradually, this situation has begun to change. Objective-C, for instance, is now well within the range of most high-level information centers. Not only does it now run on the IBM Personal Computer, but it also has an extensive library of software objects that information center managers acting as software developers can use to put together applications in a hurry.

For example, in July PPI introduced a set of software modules, the ICpak 201. This is a set of 49 components that allows developers to build graphically based user interfaces. ICpak 201 contains the raw materials for windows, menus, scroll bars and so on.

Objective-C with or without ICpak 201 is meant for someone who is both an accomplished programmer and who has the economic resources of a major corporation behind him. A development license for ICpak 201 alone is $35,000. The Objective-C compiler is $2,500.

Information center managers with these sorts of resources reportedly can improve their productivity up to 20%. Given the increasingly severe demands on info center managers' time, those numbers could make three-and-a-half-generation languages more than worth their cost. — MT

News section written by *Computerworld Focus* staff members Stan Kolodziej, Michael Tucker and Rebecca Hurst.

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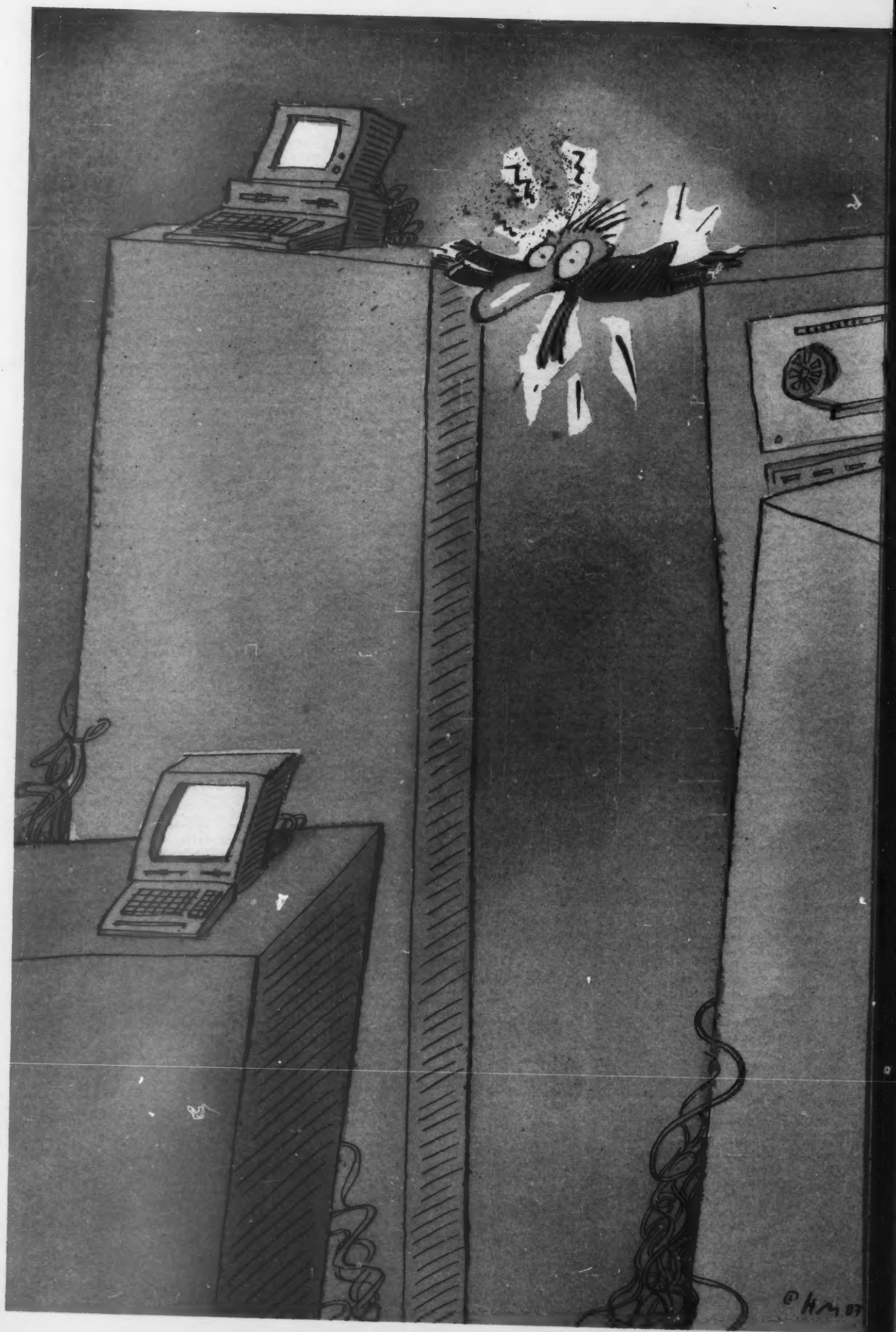
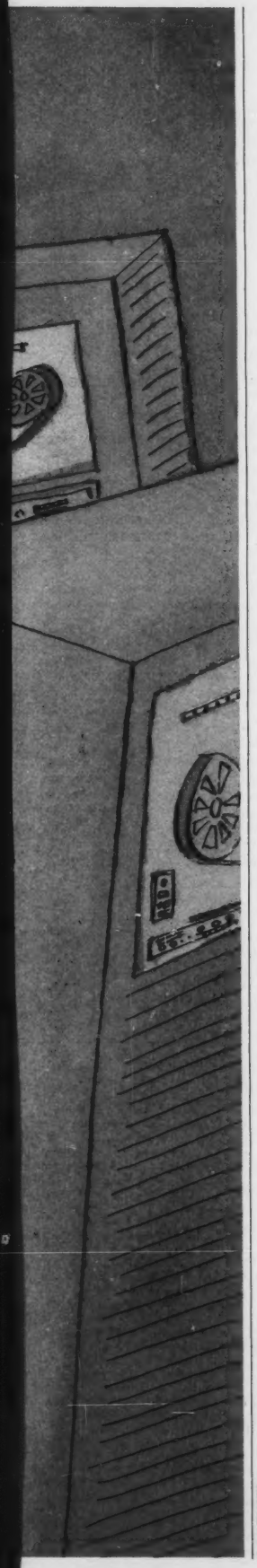


MIS, ICs close the breach

BY VAUGHAN MERLYN



HAL MAYFORTH

Although once considered radical, the information center approach to supporting end-user computing has become commonplace. So commonplace, in fact, that there is a danger that a subtle but important evolution taking place within info centers may be missed by many who should otherwise guide it.

It is important to understand the forces that are shaping the information center and redefining its role in information processing. By comprehending these forces of change and by establishing an appropriate strategic framework, end-user computing can successfully evolve while remaining compatible with a company's overall information systems strategy.

Ignoring these forces risks a divergence between the information center and MIS-directed information systems. This could lead to a fractured information systems environment and to new islands of automation that will eventually interfere with ongoing automation efforts.

In terms of its original mission, the information center was created as an organization to drive and nurture end-user computing. Its goals were to increase an organization's capacity to exploit information and information technology's benefits and to improve an individual's productivity through the use of personal computing tools.

The information center's mission was conceived in response to several forces that were acting upon MIS. First, MIS was swamped by information and information systems requests that it could not address. This applications backlog became a visible testament to MIS's inability to handle increasing demand.

Second, fourth-generation languages, despite early resistance from information systems professionals, were achieving some success in the hands of end users.

End users' experiences with fourth-generation languages were often through the auspices of third-party time-sharing vendors — a well-established backdoor through which end users could get access to technologies otherwise kept from them.

Third, personal computers, also originally shunned by MIS as toys, were finding their way onto end-user desks, this time through computer stores — a new "illicit" channel for information technology.

Finally, at the risk of losing the desktop market to Apple Computer, Inc., Tandy Corp. and others and of losing departmental computing to Digital Equipment Corp., Wang Laboratories, Inc. and others, IBM needed to champion a cause that would give MIS something to offer end users that would not usurp the mainframe. Given IBM's lack of friendly fourth-generation languages and personal computing tools, the cause needed to be largely conceptual and organizational rather than technological.

The information center concept, first formalized and christened as such by IBM Canada, was the ideal cause.

It was just what IBM needed to lessen the impact of its lack of end-user technology in high-end mainframe shops. The concept was also just what MIS needed to take the heat off its own backlog problems. It gave IBM and MIS a way to channel and control an end-user computer movement that was not only inevitable but also in danger of leaving MIS out in the cold.

So the information center was born and spread quickly as existing in-house, time-sharing support groups seized the opportunity, renamed themselves and gained new respect (not to mention new customers and the resources with which to serve them).

Companies that did not already have organizational support for end-user computing established information centers, and end-user computing became the center of attention and the focus of both training and

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support resources.

While the essence of the information center revolves around teaching and training, info centers also present themselves as in-house personal computer stores, special consulting groups, training centers, help desks and so on.

The common theme is to help end users address their information requirements.

But information centers are not without their list of problems. Lack of resources, lack of organized, understood and accessible data to satisfy users' information needs and a conflict with traditional data processing channels rank high on the list.

However, these problems tend not to arise in information centers that have a clear statement of mission and in which MIS views itself as a business. In such environments, the information center usually has established chargeback mechanisms and keeps a keen eye on cost-justifying itself to its customer base and management.

Movement remains healthy

Despite inevitable tidings of woe and destruction voiced by some, the information center movement remains healthy. A great deal of end-user computing that would otherwise go unsatisfied is today supported through information centers. This support tends to relieve the end-user burden on MIS and allows MIS to focus on requirements that do need the direct hand of a DP professional.

The information center has also contributed to increasing the computer literacy of the end-user community, with benefits that go far beyond end-user computing.

Despite its acknowledged achievements and perceived success, however, the information center can cause an artificial breach in an organization's MIS strategy and lead to two disjointed information systems environments — one for end users and another for information systems professionals.

A closer look reveals that the distinctions between the end-user world and that of the information systems professional are blurring and that the relationship between these universes must be redefined.

On the face of it, organizations consist of two entirely different communities — end users and information systems professionals — that use two different types of technologies to address two different kinds of problems.

However, a closer look reveals that the distinctions between the end-user world and that of the information systems professional are blurring and that the relationship between these universes must be redefined.

To examine the convergence that is taking place between the two worlds, we must look at the forces that are acting on MIS today.

Still faced with growing application backlogs and a need to overhaul information systems technology, MIS is now starting to embrace new technologies and methods to improve its software development efforts.

Fourth-generation languages and application generators, once shunned by the information systems professional, are now garnering widespread use throughout the MIS world.

Relational data base approaches, first found only in end-user-oriented technologies, are now increasingly being used in the MIS organization. Personal computers, once viewed merely as game-playing devices, are now at the core of revolutions such as computer-aided software engineering.

Prototyping and evolutionary development, once accidental by-products of end-user development efforts, are now accepted methods for the information systems professional.

In embracing these new approaches, MIS is finding the need for its own type of information center (sometimes called the development center), an organizational approach to identifying, implementing and supporting the techniques and technologies for application development and maintenance.

As MIS today takes a fresh look at these new tools and methods, management is recognizing the need to define a single architecture or planning structure to guide its information systems strategies.

One of the discoveries that MIS is finding is that this single architecture must be laid on top of two disjointed architectures — the traditional one that has been established within MIS and the recently established architecture that exists for end-user computing.

The main characteristic that segregates these architectures is user type, namely, either information systems professional or end user.

This segregation is unfortunate. However, the situation is changing. Sometimes the power user has requirements and capabilities that are every bit as complex as those of the traditional programmer.

Increasingly, the MIS professional responsible for creating an application is more like an end user in terms of background and experience than a traditional third-generation language programmer.

A new way of operating

Contemporary development methods avoid the traditional approaches in which end users gave MIS brief, unsolicited requirements specifications and waited for MIS to give them the finished application.

Current methods favor joint development design teams and much higher degrees of end-user involvement in the application specification and development processes.

Even the distinction between the application classes handled within the two architectures is becoming blurred. Sometimes, what begins as a simple one-off ad hoc query has a way of growing into a regularly scheduled departmental application or even into a mission-critical or strategic application.

Under a dual architecture, problems are typically tackled first within the end-user architecture by a novice user utilizing a simple on-line query processor. As the job becomes too complex for either the user or the query processor, the power user, or information center consultant, gets involved and employs a fourth-generation language.

As the job becomes even more complex and production oriented, MIS gets involved and immediately wants to move the application into the formal MIS architecture.

This move often means converting data bases and reprogramming the application to a technology better-suited to production work.

By the time the application has been reprogrammed, it has lost its connection with the original user, who can no longer adapt the application to meet the changes in needs typically associated with end-user-conceived applications.

Clearly, MIS must now plan to close the breach between the two environments.

MIS must define a single architecture that recognizes the spectrum of application classes, from ad hoc query through production application. This architecture needs to address the diversity of users, from novice end user to power user to analyst to traditional programmer.

End users are no longer the only ones who are introduced to new technologies and methods through information centers. The information systems professional also needs the support, encouragement and guidance that the information center provides end users.

Tools for diverse needs

MIS must find tools and technologies that span the end user and information systems professional roles. These tools must also offer a layered approach that facilitates the transition of an application from its simple one-off ad hoc beginnings through its final complex production application status.

Most importantly, the single architecture must define a consistent information architecture that can drive all kinds of computing activities, preserve data integrity and provide end users with a consistent view of shared data.

The information center has run its course as a special approach to end-user computing.

It has proven that fourth-generation languages and relational data base techniques have merit. Additionally, it has established an attention to the human side of high tech that helps get new technologies into use where they might otherwise be resisted.

Similar approaches must now be applied to the entire spectrum of information systems and users. The end-user experiment has laid the groundwork and set the model for a more broadly defined and cohesive strategy.

The forces that led to the information center can now be channeled into a single architectural approach that closes the breach between an arbitrarily defined end-user world and the MIS world. Otherwise, these forces will drive the breach even deeper, frustrating future attempts to unite end users with MIS. ❖

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INFO CENTER SURVEY

Info center identity crisis

BY BEATRICE GARCIA

As personal computers swept through organizations, they brought problems with them. Management realized that if it did not ride the wave of information technology, that wave would quickly erode corporate standards and control. With the belated blessing of corporate management, end-user computing, started by vigilante committees of frustrated business users, resurfaced as formal information centers.

While corporate America now embraces the concept, the information center is still in its adolescence.

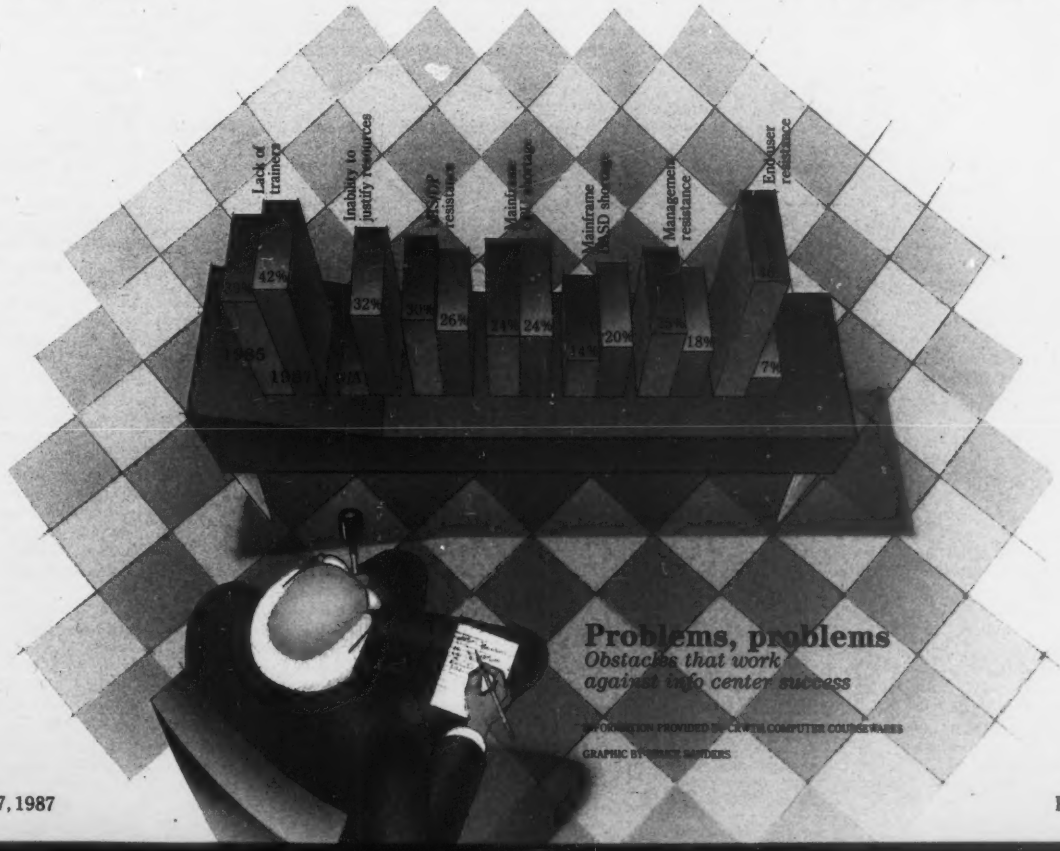
However, its primary goal remains the same: to provide end users with the software tools, training and support they need to take advantage of the power of computers. But while its goal remains constant, the benefits, obstacles and scope of the information center are changing. The computing industry is speculating about what this promising adolescent may grow to become.

Garcia conducts an annual survey of information centers for Crwth Computer Coursewares in Los Angeles. She has presented the survey results to information center users groups such as Guide and conferences including Info '87 and the Info Center Conference.

A recent survey by Los Angeles-based Crwth Computer Coursewares compared the position of information centers in 1985 with their state in 1987. A total of 450 information centers participated in Crwth's Third Annual Information Center Survey. Representing a broad spectrum of corporations and industries, all respondents were information center professionals. More than half of the respondents, or 61%, were from Fortune 1,000 companies. The remainder represented large organizations that are not commonly classified in the Fortune group; members of this category were in such areas as aerospace and the government. Three quarters of the participating companies had more than 1,000 employees and annual sales in excess of $100 million.

The number of information centers continues to increase, although the current rate of growth is much more controlled than when the concept first gained widespread acceptance between 1982 and 1984.

Only 12% of the information centers surveyed existed in 1981. But between 1982 and



Problems, problems
Obstacles that work against info center success

INFORMATION PROVIDED BY CRWTH COMPUTER COURSEWARES

GRAPHIC BY [illegible] SANDERS

INFO CENTER SURVEY

1984, corporate America embraced the info center concept. And the figures back that statement up; more than half (68%) of the information centers surveyed were implemented during that time.

Now that information centers are firmly established in most large organizations, the growth rate has slowed to an annual 10% increase in the last two years.

This decrease in growth rate does not indicate that the information center concept is becoming less popular; fewer than 1% of the corporations surveyed reported that their information center had been disbanded. Rather, it attests to the fact that info centers have saturated businesses and are now moving into a new stage of maturation.

The impressive growth of the information center in the past six years has been fueled by the benefits of end-user computing.

Users rate benefits

Initially, the primary goal of the information center was to develop computer literacy among end users. The Crwth survey found that in 1985 this education was the No. 1 benefit of 68% of the information centers participating in the poll. While roughly the same proportion (70%) of 1987 participants benefited from improved computer literacy, this benefit is no longer considered the leading contribution of the info center.

Armed with computer skills, end users are now automating routine, time-consuming clerical tasks with computer-generated reports, graphs and spreadsheets. Today, increased job productivity is the No. 1 benefit of the information center, with 80% of information centers in 1987 citing this benefit compared with 60% in 1985.

Information centers attain their primary goal when end users can process routine information efficiently. But basic information processing is just the first step. The next step is for end users to utilize this information for decision making. A business analyst who has access to corporate information can react faster and better to changes in the marketplace, thus sharpening his corporation's competitive edge. Today, 70% of information centers surveyed said they experienced better use of information technology to improve decision making compared with 58% in 1985.

Another benefit of the information center is end-user appreciation of data processing's role in the company and its contribution to their jobs. In 1987 (58%), as in 1985 (55%), approximately half of information centers said they feel an improvement in DP/end-user relations.

Even though the initial impetus behind the information center concept was to reduce the three- to five-year DP backlog, this objective never turned out to be a major benefit of information centers. In fact, the proportion of information centers experiencing a reduction in their DP backlog decreased from 23% in 1985 to 17% in 1987. But while end-user computing did not significantly affect the DP backlog, the information center is generally credited for reducing the "invisible backlog" — that is, the jobs that were never submitted to the data processing department for fear of the delay.

The benefits of the info center have permeated all levels of organizations. Of all the information center users surveyed, the largest group (40%) consists of professional staff, and 26% represent clerical and administrative staff. The number crunchers in finance and accounting make up the largest segment of users by department (24%). Tied for second place are manufacturing, sales and marketing and administration, each with 15%.

The range of software tools the information center supports reflects the needs of these large user departments. The most popular applications — spreadsheets (20%), information retrieval and reporting (19%) and word processing (17%) — give business professionals and administrative staff the ability to manipulate data and text, to generate business reports and graphics and to perform "what-if" analyses.

Surprisingly, the fourth most common request by users is for the development of data base applications (12%), surpassing both electronic mail (9%) and business graphics (8%). Now that report generation and manipulation of data from existing data bases have become routine procedures, users are identifying new applications that could improve job performance.

The range of software tools available from the info center encompasses all sizes of computers. Nearly all info centers support mainframes (93%) and micros (89%). In addition, 50% are using minis.

Users appear to be growing increasingly sophisticated in their computer use. While PCs remain the computer of choice for 60% of the users surveyed, nearly half (47%) are using mainframe computers and a fifth (22%) use minis. These numbers indicate that users are becoming comfortable with a variety of computer types, selecting the one best suited for specific applications. End users' growing sophistication can also be seen in the mainframe products info centers support.

What is surprising is not the range of fourth-generation languages but rather the number of DP tools, such as IBM's Interactive System Productivity Facility, JCL and CMS, that end users are accessing. Besides demanding application development support, users appear to be becoming involved in more programmer-type tasks.

What about the result of distributed computing? Bottom-line gains. Survey participants identified several departments that were providing the best return on investment from information center services.

Getting the most out of it

The greatest return on investment was attributed to the largest user departments: 59% to finance and accounting, whose ability to control, analyze and forecast financial data is critical to the profitability of an organization; 33% to sales and marketing, for which computer skills result in an ability to react quickly to the marketplace; and 30% to administration, which uses word processing tools to automate clerical tasks.

One unexpected finding of the Crwth survey was the fact that approximately one-fifth, or 23%, of participants claim that MIS/DP is one of the departments providing the best return on investment on info center use. At the same time that end users are learning about traditional DP tools, DP professionals are using the power of fourth-generation languages to develop applications in a fraction of the time and cost that Cobol or Fortran need.

For all the info center concept's success, however, there are major challenges. Faced with a wide range of functions and a limited staff, the biggest problem that information centers face is how to use limited resources for maximum benefits.

One unexpected finding of the Crwth survey was the fact that approximately one-fifth, or 23%, of participants claim that MIS/DP is one of the departments providing the best return on investment on info center use.

With increasing numbers of end users demanding support and training for both micro and mainframe products, the duties and responsibilities of information centers have grown dramatically. The survey found, however, that the only service area not showing an increase over 1985 is the one most commonly associated with information centers — training end users.

An indicator of the maturity of information centers is the fact that the analysis of end-user requirements — a service provided by 92% of information centers today compared with 79% in 1985 — has overtaken training as the most common service of information centers. As a result of this activity, info centers in 1987 are taking over from DP the function of selecting end-user hardware and software. Eighty-six percent of the info centers in the survey said they now perform this service, an increase of 20% since 1985.

User demands for mainframe-micro connectivity and application development have had a significant impact on information centers. Both of these services have doubled in popularity during the last two years, with the former jumping from 43% in 1985 to 84% in 1987 and the latter rising from 16% to 33%.

Indeed, these services may well transform the information center's current role of supporting simple, stand-alone applications aimed at personal productivity to overseeing the development of complex applications aimed at work groups and departmental areas. Info centers are also still expected to provide hot-line support (1985: 78%, 1987: 81%), access to corporate data (1985: 58%, 1987: 80%) and computer graphics facilities (1985: 59%, 1987: 68%).

While the benefits of end-user computing are compelling, several obstacles may still jeopardize information center success (see chart page 15). And like the benefits, these obstacles will continue to change as the information center concept matures.

Management and users alike now recognize information technology as a competitive weapon. Only 7% of info centers in 1987 say they experience the end-user resistance felt by 46% of information centers in 1985. Management resistance has decreased from 25% in 1985 to 18% today. The fact that management resistance still lingers is probably due to one of the main obstacles hindering information centers — the inability to justify resources. One-third, or 32%, of the information centers in the survey reported they encounter this problem today.

If not quickly addressed, the info center's inability to justify resources could arrest the development of end-user computing because of the inability to get the funds for necessities such as personnel.

And the critical lack of info center staff compounds the challenge of expanding services and increasing user demands. Lack of trainers is the chief obstacle information centers must overcome. More than 65% of information centers claim they are understaffed in a variety of critical job functions, such as trainers, product specialists and application development specialists.

To combat the personnel shortage, information centers are implementing several techniques to increase the productivity of their limited staff. More than 59% are turning to the user community for information center liaisons. Supplementing the limited info center staff, departmental power users are dealing with front-line business computing questions. Many information centers (36%) have implemented structured users groups that encourage users to share tips and solve problems themselves.

Mentioned by 61% of the surveyed centers, the leading technique for increasing the productivity of the information center staff is computer-based training (CBT), an interactive, self-study instructional method delivered via a terminal.

In a time when there is a shortage in the number of qualified data processing trainers, CBT is uniquely well-suited to satisfying diverse end-user needs. In the modern corporate environment, business professionals, clerical and administrative personnel and supervisors have terminals and PCs at their fingertips and can access CBT courses from their workstations when they need training.

CBT to the rescue

Information centers using CBT have identified its positive results. It provides better training availability (89%), permits individualized training (82%) and is more cost-effective than traditional methods (78%). Particularly important to 78% of information centers using CBT is that it frees trainers from basic, routine training, enabling them to act as consultants or advisors to end-user professionals on a wide range of advanced problems and individual applications.

The tough economic conditions of the business world today have intensified the need in all companies for more effective analysis, planning and control. By supporting end-user computing, the information center can play an important role in providing faster, better access to corporate information. However, the success of the information center will depend on its ability to grow and mature as technology and user demands change.

Having achieved its original goal of promoting computer literacy, the info center is now redefining itself in a world of increasingly sophisticated users and skeptical management. Its success will depend on many factors: management commitment, end-user cooperation and effective training. Supported by these resources, the information center can become a significant force to increase bottom-line gains and sharpen the corporate competitive edge. ❖

CORPORATE POLITICS

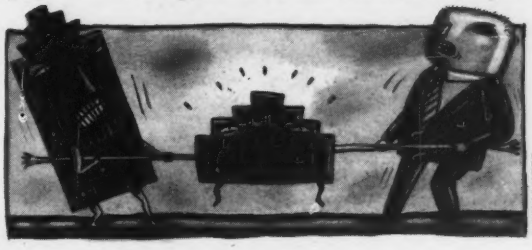
Control up for grabs

Power tug-of-war between MIS, ICs

BY STAN KOLODZIEJ

The information center was doing very well. Like most information centers, it had started out with few expectations from MIS, but after several years, the info center had established a growing rapport and support from end users.

The info center was doing a good job in getting the ear of top management as well, something MIS had been striking out with recently. As a result, the information center seemed to be growing more independent. In a short period, its policies had changed direction and were not always in sync with those of MIS.



JAMIE BENNETT

MIS, the info center's creator, stepped in and closed the center. It was a classic case of jealousy, of the mentor resenting the pupil's success then lashing out.

"It was also an extreme case, but it points out some of the conflicts simmering under the apparent harmony of many information center/MIS relationships," claims David Phillips, president of David Phillips Associates, Inc., a New York consulting firm that deals with info centers and MIS. "It's all very subtle and under the surface, but these struggles exist."

In another case, this one taken from a report issued by the American Management Association (AMA), the MIS department of a large New York-based financial institution came down hard on its information center, which it claimed was blocking MIS attempts to impose standards on personal computer purchases and security.

"If the job of the info center is to oversee and coordinate end-user activity, it was doing a poor job," explains the financial firm's director of systems development. "They were antagonistic toward the data processing department, and they represented a dilution of the department's power."

MIS resentment of information centers can come from many directions. One primary cause, for example, is the tendency of many info centers to gravitate toward independence.

"You have to remember that most info centers have close relationships with MIS that have gone through conception, birth and maturity," Phillips says. "A sudden independent attitude can breed resentment and counteraction from the other party."

In many cases, growing independence has led to a change in the image these centers present to top management. More information centers are becoming adept at making sophisticated self-promotional pitches to those who control the money.

Ellen Snoyer, president of the Dallas-based Information Center Institute (ICI), says ICI members are now using a combination of newsletters, regularly scheduled meetings, management training sessions and seminars to promote themselves to upper management.

"More than half of our members also say that top management is [demonstrating its support] of information centers through increased financial commitment," Snoyer says. "Their word must be getting through."

During the course of his info center consulting work, Phillips says he has also seen a rise in the number and quality of information center self-promotions.

"There are certain corporate departments like data processing and human resources that have always been like orphaned children and that have never done a good marketing job with corporate budget committees," Phillips claims. "In the past, financing for the DP department was a given. Not anymore. Now MIS has to pitch for its funds, and that can be awkward for them."

"Information centers, in the meantime, have been dealing with marketing and accounting types, who generally have a history of being able to promote themselves well and who have been using the best in PC graphics and software to do it. The information centers learn such slick promotional expertise then use it themselves on the top brass. That can rile MIS," Phillips reports.

John Plunkett, project manager for information center customer services at Virginia Power in Richmond, Va., adds, "If you look at a typical information center, you have people who have to explain technical things to laymen. That's a talent that can be exploited by info centers in selling themselves to top-level management, who also tend to be technical novices."

Phillips says that info center self-marketing "can mean the difference between having a bridge or empty space to cross when a budgetary cliff is reached. More information centers realize that they have to market themselves from the top down as well as the bottom up in an

Kolodziej is *Computerworld Focus*'s senior editor.

organization. They are getting street smart."

Information centers can also step on some toes on the way there, so Phillips says he likes to add one important caveat.

"I strongly suggest that the info center get MIS support before they start marketing to the upper management bracket," he says. "I've seen resentment develop in which MIS departments felt they were betrayed when the information center bypassed them in a marketing move."

Charles Marques, an assistant vice-president at Goldome, a financial institution based in Buffalo, N.Y., points out another potential sore point between the info center and MIS. Marques, who is in MIS and was responsible for the information center setup at Goldome, claims he has seen other problems develop when an MIS department coauthors programs with the information center.

"The coauthor syndrome isn't recognized yet," Marques says, "but it does something to MIS when a part of its main services, [that of] providing corporate applications programs, is suddenly shared by an info center," he says.

Defaults to info centers

"In a way it's the fault of MIS. If end users need an output report and they have to wait a long time for the mainframe CICS application to go through, the project will default to the information center, which, chances are, now has the expertise and tools to do it," Marques says.

Virginia Talamo, an information manager at New York-based Coopers & Lybrand, says she thinks info center independence is working directly against a general progression toward more MIS control over information centers.

"While MIS managers have tended to stay with mainframes and have never really entrenched themselves in the corporation, info center people have been out in the field, gaining the support and backing of end users," according to Talamo, who is the MIS staff member in charge of her firm's information centers. "MIS might control the networks, but information centers can stand on their own, and the future relationship between MIS and information centers is going to be one of partnership, not of control. Because of technological necessity, there has to be more cooperation between MIS and information centers in the future," she says.

Phillips agrees with Talamo. "Where info centers are not so successful, there is a good chance they are being undercut by [MIS] jealousy," he says.

That was the case at a Long Island, N.Y., firm, whose info center manager, wishing not to be identified, declares that he had to resort to some interesting marketing ploys to appease the MIS forces opposing him. "I used to fight the [MIS] politics," he explains, "but if you can work with it, you can get a lot further.

"Now every six months I send out a report that shows how MIS contributed to the progress of the information center. That makes them feel directly involved. At the same time, we put together executive seminars that explain how the information center is a business unit within the organization. If there's one thing I've learned, it's that you have to relate to these people on their own terms," the info center manager claims.

"In traditional MIS situations," Phillips explains, "the user goes to MIS, makes a request, comes back in 18 months and says that's not what he wanted. A good information center today will have consultants that act like true management consultants, who will sit down with end users and discuss what they want in depth.

"Users are thrilled to get that kind of one-on-one attention," Phillips adds. "That can result in an undercurrent of jealousy in MIS departments that don't know how to get close to end users."

Green with envy

In some cases, such envy can lead to extremes.

"Our end users are always trying to hire away information center consultants because they don't want to share the consultants' expertise with others," explains the info center manager at the Long Island firm. "Most of these information center people have come from MIS backgrounds, and many were being groomed to return [to MIS]."

Phillips sees this kind of corporate raiding becoming more prevalent.

"Information centers are allowing their best people into the user community, and line management loves it," Phillips explains. "They think they're getting some expertise right there on their premises. It can rankle less-progressive MIS departments, those who see it more as an erosion of their political control and less of an aid to end users."

Carol Longest, an associate information center analyst and Plunkett's colleague at Virginia Power, says their MIS department never expected much from their information center, which Longest now describes as mature and thriving.

"They thought of us as the fun bunch who wouldn't do much with these personal computers," Longest says. "Now they realize their mode of operation has to change, that they have to get closer to the users, and they see us as a good way of doing it. I see the information center as a method for MIS to change their image as heads-in-the-sky types."

Not that Longest says their information center is at odds with MIS. "I think MIS has to lead the way because they understand the hardware and systems out

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there," she explains.

Kay Fletcher, a technical administrative specialist at the Los Alamos National Laboratory in Los Alamos, N.M., says that as information centers take on more responsibilities like consulting and developing applications, there is going to be some crossover between MIS and info center functions with some resulting friction.

One for all, all for one

"I hope MIS doesn't retreat back into its large systems," she says. "For everything to work, MIS and information centers have to work together."

Plunkett lists other reasons, however, why info center/MIS relations could be a little less amiable than desired.

"Information centers attract a wide variety of people with different backgrounds," Plunkett explains. "Those who do not come from a systems background are not going to have the same kind of loyalty [to MIS]."

Plunkett adds a steady spate of favorable information center press to the list. "It often seems that information centers can't do anything wrong, and MIS can't do anything right," he says. "MIS is often put in the position of bully by the press. I guess it's the underdog syndrome."

According to the Long Island info center manager, MIS can sometimes move at a snail's pace when it comes to recognizing the importance of small systems. The delay can breed resentment at the info center and end-user levels.

"Senior-level [MIS] people still work with larger systems, and the small systems technology hasn't risen high enough in organizations for the DP staff to see its benefits and support PCs," the manager claims. "While I don't think there's as much MIS turf management, there is also not as much cooperation with information centers as there probably should be. MIS departments can't go on operating in the old ways, in which users go to them, tell them what they want and then leave, while the systems people work in isolation like building contractors."

Whether MIS and information centers need each other is arguable. The fact is, however, they will certainly have to try to live in harmony. A recent survey conducted by Crwth Computer Coursewares, located in Los Angeles, found only 7% of the info center respondents reporting to a department other than MIS, including 2% of that group who report directly to the vice-president of finance. The remaining vast majority of information centers report directly to MIS. These Crwth figures help point out the continuing monolithic presence of MIS in the life of most information centers.

"Some of those info centers I've seen that don't report to MIS are now paying the price of not having established, firm guidelines issued by MIS," Longest claims. "It often becomes a nightmare."

Talamo and others, however, point to figures that indicate that more info centers have tightened their grasp on their own budgets and purchases. If money equals power, then it appears information centers are controlling more of both.

"If anything indicates that information centers have more direct control over their destinies, it's that they have increased their purchasing power since 1985," declares Eric Rolfe Greenberg, project director at the AMA in New York. Quoting from a 1986 AMA study of information centers, Greenberg claims, "about two-thirds of all information centers have to sign the purchase requisition before micro hardware or software may be bought, and nearly one-third can now sign off on mainframe expenditures."

Crwth studies show these figures could be even higher. During the course of its information center study, Crwth found that about 60% of information centers contacted controlled a majority of the mainframe-based hardware and software products aimed at end users.

"Even so," Talamo cautions, "MIS still controls the accounting functions, and I can't see that changing in the short term. The fact is, mainframes are handling more of the back-office functions, and PCs are handling more of the up-front, analytical stuff. By technological necessity, MIS and information centers will thrive and work more closely together. The aspect of politics and control will fade, because the technological imperative is going to make cooperation and mutual handshaking a first priority."

Precluding political power plays

Part of this movement involves integrating small systems with large systems, which should preclude many potential MIS and information center power plays because the time available for political maneuvering will shrink.

Goldome's Marques says that much of this emphasis on greater cooperation will come from MIS.

"Until now, MIS had spoken only one language, that of the mainframe. But now they'll have to be bilingual and also speak to end users." Marques adds that if MIS remains isolated and misses its opportunity to become part of the larger scene, it will have problems later.

"I've only seen a few cases in which MIS departments have blatantly controlled and used info centers to gain political ends," Phillips says.

For Phillips, the equation is easy: With success comes power, and if that power is not undercut, it will grow. "The fact is, I haven't seen much information center power being undercut for the sake of political control," he says. ❖

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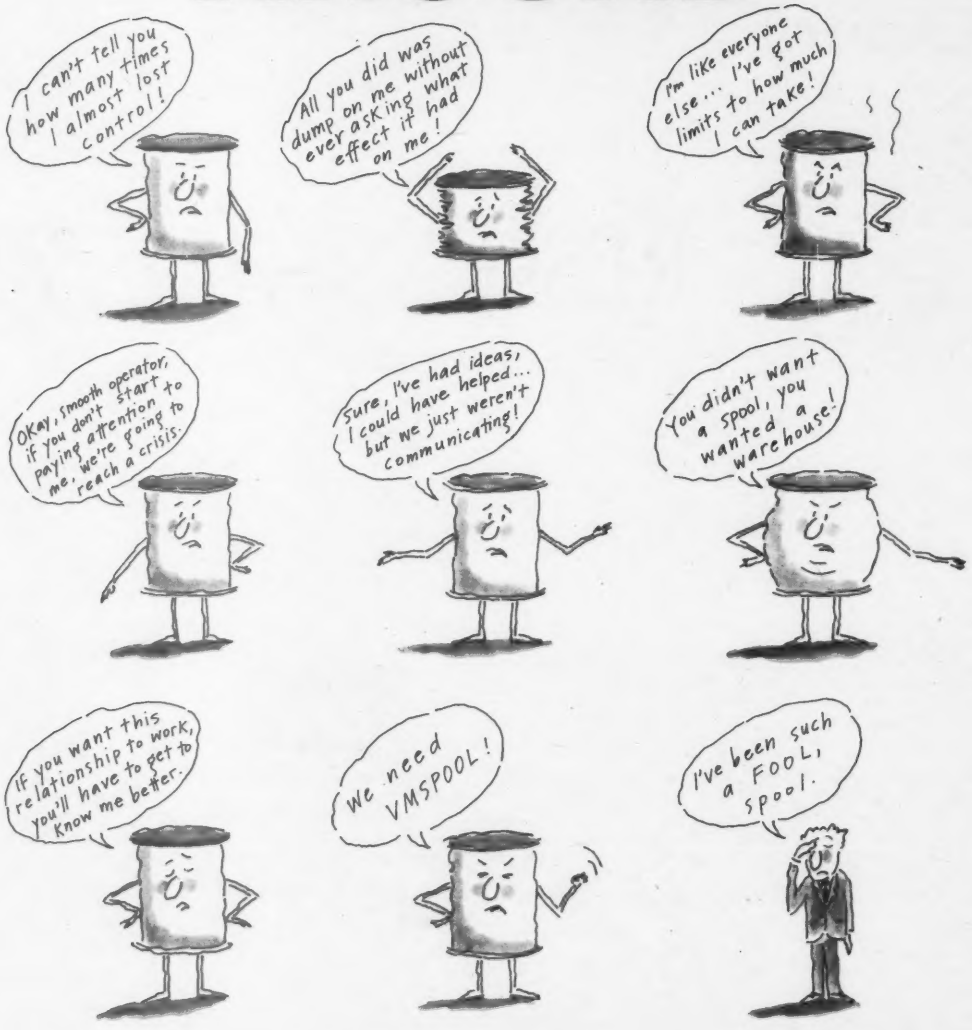
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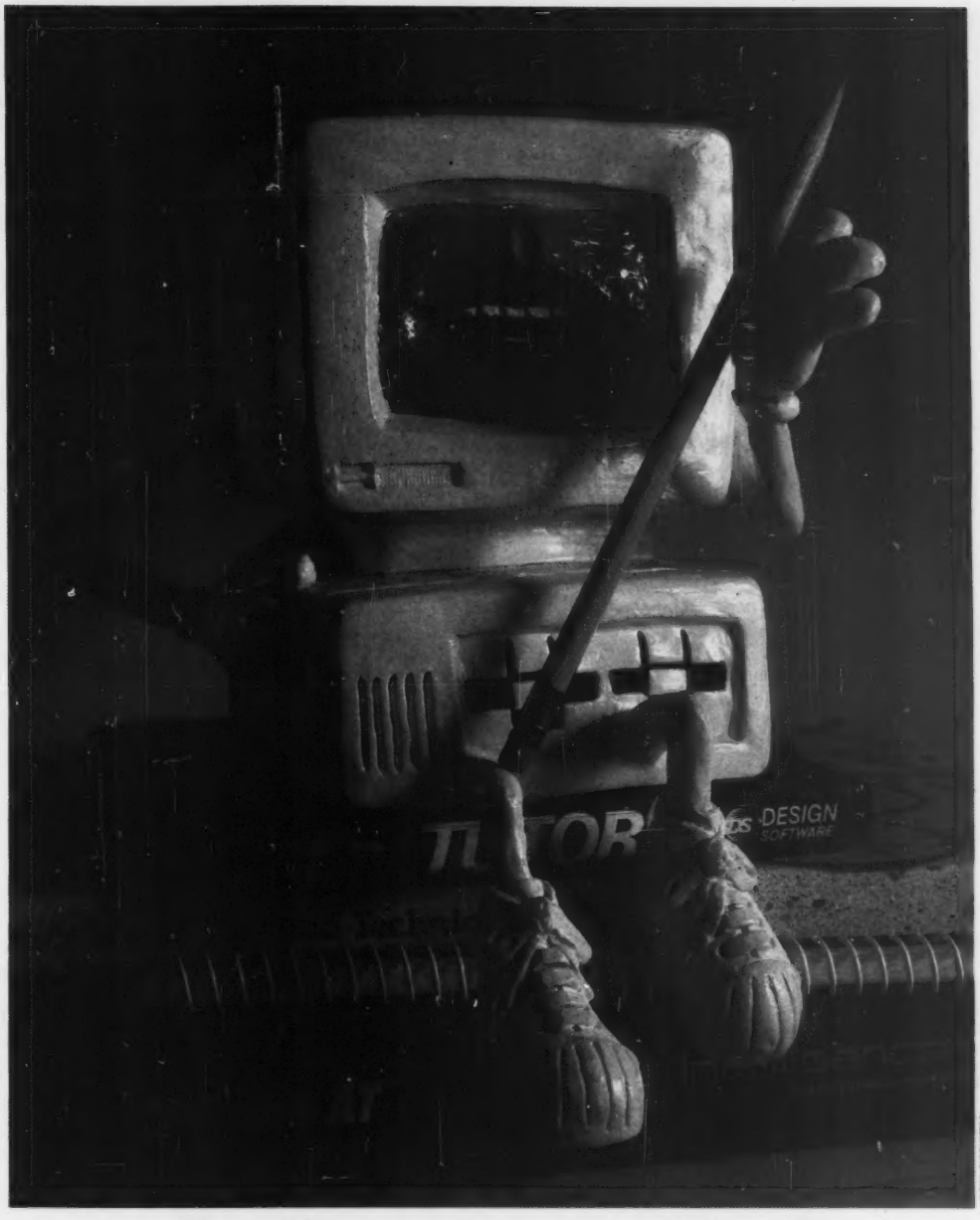

GEOFF O'CONNELL

Business goes to school

BY MICHAEL TUCKER
FEATURES EDITOR

The function of the information center is in flux. Its original purpose — that of providing microcomputer-based services to end users — is no longer an exclusive mandate. Increasingly, MIS is finding different ways to bring computing power to end users via executive information systems and work group computing, for example.

But there is one area in which information centers remain unchallenged — training. Many trainers and MIS personnel would argue that info centers are the best place to perform the basic education of the majority of nontechnical users and some technical ones as well.

What can cause some consternation is the sheer number of training methods available. MIS and the trainer must decide whether users are best educated by live instructors, computer-based training (CBT) materials, interactive video training optical disks or plain, old-fashioned workbooks. Deciding which approach makes sense in terms of economics, technology and user goals is no small task.

"It's an art rather than a science," notes Larry Page, manager of training and development at St. Louis-based General Dynamics Corp. "The instructional designer has to generate a vision of the system, a vision of how each piece functions with every other, and then deliver."

Training technologies can be plotted on a spectrum ranging from the expensive to the cheap. At the high-cost end, there is one-on-one live instruction in which one teacher directly supervises the progress of one student. At the inexpensive end, there is the common workbook instruction in which students attempt to be their own teachers.

As a general rule, what

Tips on how to implement artificial intelligence training in your firm, page 22.

makes training costly is the degree to which human instructors are involved in the process. The more time any one individual must spend training any other individual, the higher the price of education.

By like token, one-on-one live instruction is by far the most effective means of getting ideas across. Quite simply, no method of education has ever been devised that has proven more effective than the master/apprentice relationship.

But information center managers must deal with the same quandary that perplexes public schools the world over: what works best, costs most.

However, there are times when even direct, one-on-one tutoring can be worth its price. Kenneth Bosomworth, president of the consultancy International Resource Development, Inc. in New Canaan, Conn., notes, "Which technology you use is as much as anything else a function of how many people you have to train."

Thus, if the number of trainees is very small — for example, only one person — it can be cost-effective to go the one-on-one route. This situation holds true especially if the trainee pays part or all of the cost or if the trainee is important enough to the organization that expense is no object.

A number of both public and private organizations currently offer this kind of intense training in fields as diverse as Cobol application generation and the use of spreadsheets.

A representative training company specializing in end-user computing is Unisource Texxtel, Inc. in New York. For $75 an hour with a three-hour minimum, Unisource will provide on-site, one-on-one instruction in the use of the personal computer. Company President Dick Lutz notes that Unisource's clients are frequently high-ranking corporate officers who simply cannot deal with classroom instruction.

The next step beyond individual tutoring is the small-group, interactive lecture. This type of instruction can be further subdivided by cost according to whether the lecture is done in-house or outside the organization. Again, which of these training methods to choose depends on the number of individuals the information center manager wishes to train.

International Resource Development's Bosomworth explains the economics. "If you've got thousands of people to train, and you are going to do it again and again, month after month, then you'll probably want to run in-house classes. But if you want to do training in, say, data network simulation, and your entire data communications staff consists of three people, then you're better off going with one of the out-of-house seminars offered by private and public groups around the country."

College bound

In fact, if your numbers are small and the subject matter relatively undemanding, it could be that you can unload your training requirements to the local community college. Virtually any local adult education program can now provide good, inexpensive training in such areas as word processing, the use of common spreadsheets and so on. More technical training can usually be found at various private seminar houses.

The decision to bring in an out-of-house training course is based, again, on cost. According to Bosomworth, "The magical cutoff point is simple. Most out-of-house training programs cost between $300 and $600 for each student. You'll also have to pay for each student's room and board during the same period. So, make it $1,000 per person per course. Now, the instructor teaching that course would probably agree to do it in-house for no more than $3,000 to $5,000. So if you have 10 people taking that class, you'd be well advised to bring it inside."

Thus, an information center manager can become a kind of training broker, discovering needs within the company and then locating the necessary expertise at the right price. Increasingly, some information center managers are finding that their best market is not the end user in search of basic computer literacy, but rather MIS people seeking nontechnical training.

For example, Arnoudse and Ouellette Associates, Inc. in Bedford, N.H., has carved a niche for itself as a marketer of in-house seminars in consulting and marketing skills for MIS officers. The company's belief is that if MIS is to maintain its importance in the corporation, it must forge a new relationship with end users. MIS must learn to sell its services to users as though it were a profit center.

One user of Arnoudse and Ouellette's services is Jeff McEwen, associate director of information management training for Massachusetts Mutual Life Insurance Co., located in Springfield, Mass. During the past year, his firm has had more than a hundred MIS employees participate in Arnoudse and Ouellette's seminars.

Technology monastery

"What they are getting from the seminars," McEwen says, "is an idea of how to market themselves. Rather than just taking orders from end users or going to the other extreme and trying to tell end users what they want, we look for some kind of middle ground. We want our people to get out of the monastery of technology and into the business mainstream."

Ultimately, though, whether seminars are done in-house or out of house or by company employees or free-lance consultants, live training is expensive. "Cost is in delivery, in having human instructors," Page claims. He explains that once a training course has been developed, it can be given again and again. The cost of development itself is up front.

However, the cost of delivering that same class is constant. Each time it is taught, the information center manager must pay an instructor, with the price going up with class size. Therefore, Page says, "if I have 30 trainers, and I can get 10 delivering courses while 20 develop courses, I'm better off."

International Resource Development's Bosomworth makes a similar point. "Everyone would love to somehow develop techniques that would insert knowledge into people's heads without the huge expense of a live instructor. You have considerable economic motivation to experiment with such technologies as computer-based training and interactive video training," he reports.

Interactive video training is a relatively new technology that is now gaining a strong following in training circles. Essentially, an interactive video training workstation consists of a compact disk/read-only memory

Get a jump on your AI education

BY TED BUSWICK
SPECIAL TO CW FOCUS

IS THE TRAINING FIELD ready for artificial intelligence education?

If your organization has AI development in progress or is planning some future AI activity, you should be getting AI training under way as well. Some companies, such as Texas Instruments, Inc., Digital Equipment Corp., Hewlett-Packard Co. and IBM, have major AI training programs in place already.

But what if your firm is not as prepared? How can you tell if you're ready?

If artificial intelligence work is in its earliest stages, which is the likely case for most companies, it is best to talk to the AI development team.

Look for the AI champion, that person who spearheaded the drive to AI and who shepherded the project through the approval cycle. It is likely that this person has a vision of AI for your organization. Ask him or the development team questions such as the following:

- Are more AI development projects planned?

If there are more projects, you may need to initiate training for management, project leaders and knowledge engineers.

- Is it important that end users of the system understand what is behind the software?

If end users require this knowledge, then they may need an introduction to AI.

- Will your company be selling an AI-related product?

If your company will market an AI product, then the sales and marketing people may need to learn about AI, expert systems or robotics.

AI and training are a combination increasingly in the news, as many examples indicate. The *Training and Development Journal* recently ran a cover article on the subject. And during the American Society for Training and Development's first Technical & Skills Training Conference in Cincinnati from Oct. 18-21, there will be extended sessions for corporate trainers and AI. A morning session on Oct. 20 will introduce trainers to AI, while an afternoon session that day will focus on how AI can be used to create training programs.

Don't let the onslaught of AI in training catch your company by surprise.

Buswick is product development manager for Reading, Mass.-based Addison-Wesley Training Systems and director of the American Society for Training and Development's Engineering Continuing Education Network.

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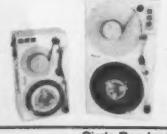

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(CD-ROM) or compact disk interactive player plus some software and a monitor. Students could then work their way through courses in almost the same way they might work with a live tutor. The screen presents students with images of an instructor or with visual aids while they take tests and otherwise communicate with the program via a keyboard.

Interactive video training is one of the most effective of the teacherless methods of instruction; it is also one of the most expensive. On the spectrum of cost and performance, interactive video training falls nearly in the middle, almost exactly on the dividing line between live and mechanical instruction.

Interactive video firms

Many major training firms are becoming involved with interactive video training in one form or another, including such companies as Chicago-based Science Research Associates, Inc., which is a division of IBM with training as its mandate.

Another more representative vendor that is not linked to IBM is Advanced Systems, Inc. in Arlington Heights, Ill. Until five years ago, Advanced Systems' presentations consisted almost entirely of live seminars and videotapes. However, Advanced Systems has recently gotten into interactive video training with a passion.

The company now has an entire library of interactive video training course offerings, ranging from highly technical material to human resource skills, available in a number of different CD-ROM and compact disk interactive formats. Advanced Systems' standard interactive video training offering consists of an IBM Personal Computer, a laser videodisk player and assorted course materials. Pricing varies according to the course.

One Advanced Systems' customer and an interactive video training user is Larry Larock, administrator for data processing training and development at the Automobile Club of Southern California in Los Angeles. He uses interactive video training as part of a wide variety of training technologies. "We never," he says, "rely on any one approach."

However, Larock does see a distinct place for interactive video training within his organization. "We've found interactive video to be successful. We've found it can be very good when the student is going through a lot of material. Additionally, interactive video can be useful in a situation in which a student has already been through a previous learning system but you're not sure what that student's level of learning really is. This is particularly true in the case of a new hire," Larock explains.

In other words, a trainer can use interactive video training to put a new employee into a kind of flight simulator, a pseudo work situation in which the subject's reactions to various real-world problems can be judged with far greater accuracy than they could from the results of a written test. He cautions, though, "You don't want to use interactive disks with subjective types of material . . . where you have many different degrees of correctness."

General Dynamics' Page is another Advanced Systems customer and, as of last year, an interactive video training user. Page is a fan of all computer-assisted training methods, partially because of the cost of live instructors. "It makes sense to let the machine do the talking," he says.

Page also favors computer-assisted training because it provides greater control over the instruction. "If a machine does the instruction, it's consistent. You don't have problems with human instructors interpreting the material differently from the way you meant it. And you don't have teacher burnout problems," he notes.

The rise of CBT

Less expensive than interactive video training and one more step removed from live instruction is computer-based training (CBT), also referred to as computer-based courseware.

CBT is probably the most active area in training today. CBT products range in sophistication from complex mainframe systems to little more than old-fashioned workbooks on floppy disks.

CBT materials exist in almost every subject area. Information center managers can, for instance, turn to Data Base Management, Inc. in Manchester, Conn., for courseware that teaches the fine art of IBM SQL programming and IBM DB2 use.

Or managers can go to Columbus, Ohio-based Dpec, Inc. for courseware that ranges from obtaining basic computer literacy to using advanced IBM MVS JCL procedures.

Managers could also go to Goal Systems International, Inc., also located in Columbus, for Phoenix system courseware. Phoenix is a mainframe-based (but not a mainframe-dependent system because it also can access PCs) CBT system that can be tailored to meet various industry-specific educational needs. It can effectively act as an operating environment in which other types of courseware can find a home.

Not only is Goal offering educational media under Phoenix — including, for instance, courseware in the use of the IBM VSAM data base management techniques — but a number of third-party suppliers are as

The human aspect of change

BY STEWART STOKES
SPECIAL TO CW FOCUS

WHY IS CHANGE so difficult for people, and why do we resist it? No one is exempt from this resistance. We all dig in our heels now and again. Being affected by change rather than instigating the changes is a new experience for MIS. Now, however, because of end-user computing, the information center and the personal computer, MIS itself is changing.

The following are reasons why we find change difficult and, at times, fight it:

- People don't see a reason for the change.
- People fear a loss of status, power, authority, freedom, responsibility, money, self-image, employment and the like.
- People worry that their loss will be greater than their gain.
- People may have had a history of negative experiences with change.
- They fear lack of competency or an inability to perform the new task or function. This is one of the biggest problems MIS has to help people overcome.
- People fear the unknown.
- They use the change as a focal point around which to cluster a collection of grievances.
- They suspect the change will result in a new social structure, altering who works with whom, when and how.
- The timing of the change seems poor. People feel change usually occurs when the circuits of the social system are overloaded.

The more MIS managers know about the human side of change, the more effective they will be in managing the technical end. Unintended negative consequences will almost always result when the human aspects are ignored.

Stokes is vice-president of QED Information Sciences, Inc., an educational and training firm in Wellesley, Mass. He is the instructor of a course entitled, "Managing Change in Systems and User Departments."

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well. Dpec is a member of this latter group.

Information center managers may also seek out Champaign, Ill.-based Regency Systems, Inc., which has developed a programming language called TEL, or Training and Education Language, specifically designed for developers working in the instructional market.

In fact, the CBT market has become so crowded that the information center manager looking for instructional software may be better off regarding it as a type of vertical application. Rather than seeking suppliers of educational software, managers could narrow their search to vendors playing in specific markets.

For example, one small CBT newcomer is Wisdom Simulators, Inc. in Cambridge, Mass. At the moment, the company's Microsoft Corp. MS-DOS-based products are geared exclusively toward two industries — banking and airlines — and toward specific target professions within those industries, such as tellers and platform officers and reservation clerks, respectively. Moreover, Wisdom Simulators squeezes its educational target down even further. Rather than teach theory or fact, the company's products attempt to teach judgment.

Mimics real life

In practice, teaching the judgment skill means that students sit down with the products running on a PC and are then presented with a series of ghastly, real-life situations that they most likely will encounter in their professional lives. Bank tellers, for instance, may have to deal with a fast-change artist or an abusive customer. The program is like a text-only computer game, except that an error brings not imaginary harm but rather a description of exactly what the user has done wrong and how much it could cost the bank.

Most of Wisdom Simulators' customers use the product as an adjunct to a program of live instruction. For instance, Carol A. Davis, training officer of the Norwalk Savings Bank in Norwalk, Conn., began using the "Judgment Exerciser for Bank Tellers" as a follow-up to classroom instruction for new employees. She notes, "We give it to employees in their second week or so. It gives them a sense of what it's like to deal with real customers — including the nasty ones."

Some users see the teller product as an actual test rather than merely a training device. Alta M. Leonard, assistant vice-president and branch coordinator of the Summit Bank of Marion, located in Marion, Ind., notes that her firm uses the product to measure the skills of both new and old employees. "We use it as a test of judgment," she says. "And we're finding that the people who don't do well on it are pretty often the same ones who weren't doing too well in real life, either."

Wisdom Simulators' CBT package starts at $2,500.

Below interactive video training and CBT in price are standard videotape and workbooks. These techniques are, of course, not far removed from self-taught methods and their effectiveness is directly dependent on the students.

Still, given a strongly motivated student, such systems can be effective and extremely inexpensive. This is particularly true if they are used in combination with other methods of instruction.

> **"It is interesting to contemplate the day when courseware and other technologies are actually more effective than live teachers."**
>
> KENNETH BOSOMWORTH
> INTERNATIONAL RESOURCE DEVELOPMENT

Video training courses are numerous and diverse. They range from such tapes as "The PC Primer," a basic introduction to computing for the novice end user from New York-based Microvideo Learning Systems, to an entire video-based course in the application of artificial intelligence from Addison-Wesley Publishing Co. in Reading, Mass. The course serves as an entire study program on AI for high-level, nontechnical managers. It is effectively a school-in-a-box, with lectures on tape and exercises in workbooks.

At this point, the information center manager has traveled to the far end of the training spectrum. Workbooks are about as removed from live instruction as one can get. Here, the advantage stems from reduced costs. The disadvantage is that the information center manager has almost entirely lost the interactive and immediate nature of live instruction.

Is there a way to combine the cheapness of self-teaching with the power of the live instructor? At the moment, no.

But that situation may not last forever. As interactive video training and CBT become more and more sophisticated, they may someday approach the effectiveness of live instruction.

According to Bosomworth of International Resource Development, "It is interesting to contemplate the day when courseware and other technologies are actually more effective than live teachers. But then, the significance of that development would go far beyond industrial training into public education. It would be a revolution." ❖

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End users need not apply

BY STAN KOLODZIEJ

Paul Schaeffer likes to tell his people to get out more often. Schaeffer, manager of information center office systems at the Public Service Indiana utility in Plainfield, Ind., advises his information center staff to get to know its users' businesses. When his staff members get to know the business, Schaeffer reasons, that's when their own business will grow.

To increase such user/information center closeness, Schaeffer has developed a program called the "Business Analyst." The program takes people with the requisite people skills from Schaeffer's information center and MIS areas and seeds them into the user community to learn the business of a particular user department. While the business analysts learn, they also act as the departments' info center liaisons and general troubleshooters.

The "Business Analyst" program might be unique, but the reasoning behind it is simple enough. Those information centers that have a finger on the pulse of user departments are going to be more helpful than those info centers that deal with user departments only when there is a fire to put out. If it helps the users, Schaeffer claims, it's going to help the company. And if it helps the company, it's going to help the career paths of the info center staff.

Schaeffer sees "Business Analyst" as a way of keeping the information center career juices flowing at a time when some centers in the U.S. are analyzing and reevaluating their missions. The outcome of such soul-searching will have a direct bearing on the kinds of career opportunities available to the info center staff.

Information centers are young and expected to mature quickly. Keep in mind that the majority of centers came into existence between 1983 and 1984, a period marked by intense corporate personal computer purchasing. Information centers rode high on the personal computer tsunami. PCs were coming into companies fast, and training and installation were information center priority No. 1. The centers had little time for self-analysis along the way.

The dropoff in the growth of information center installations after 1984 was steep. Computer Intelligence, a La Jolla, Calif., research group, for example, estimates that the number of information center sites in the U.S. increased only 3% between July 1985 and July 1987.

When the PC wave ebbed, many information centers suddenly found themselves facing hard questions. Not far down that list was the very real question of survival.

Nowadays, fewer information centers worry about survival, and many centers are thriving, expanding and changing. Part of those changes involves new statements of mission.

According to Ellen Snoyer, president of the Information Center Institute in Dallas, a recent survey of the institute's members indicated that at least a quarter were experiencing significant changes in their information center mission statements.

"A lot of the results pointed to our member information centers going their own way in roles and job functions," Snoyer says. "They don't see themselves as a support tool for MIS any longer."

As information centers break computer ground, new career avenues are also opened.

"With us," Schaeffer says, "there has to be new movement in the information center for staff members to grow into. We approach it from the view that if what the center is doing is continually strengthening the strategic role of computers in our organization, then that will open more doors for our info center people."

For example, Schaeffer says, his information center recently scanned markets to locate and test some much-needed heat loss and gain software packages for its marketing department. The center also created a new program that uses plant equipment more efficiently. Though not earth-shaking projects, Schaeffer says, these undertakings involved close cooperation between the information center and user groups. Furthermore, both programs are indicative of what can expand an information center person's role beyond training and installation.

"There are big changes in information center career paths," Schaeffer claims. "It's all happening fast. Only a few years ago, the information center staff was from the DP side. Not anymore. As information centers mature, the

TOM HUNT

PC user careers don't lead to MIS

Kolodziej is *Computerworld Focus*'s senior editor.

DP people say they have to learn more about the technical and automation sides of PCs. So they came to the information center to learn about them. In the meantime, we've brought people in from the user community, and we've placed DP people into the user community. In the end, this will make data processing people more marketable."

Schaeffer adds that although his business analysts usually carry more of an MIS background, communication skills are as important as the technical skills they can bring to the table.

> **MIS might welcome back its own, but it seems to turn a cold recruitment shoulder to those information center employees without MIS backgrounds.**

The majority of information centers are still under the aegis of MIS departments, a relationship sometimes rife with political overtones. Nothing will raise the hackles of an MIS manager more than using the word "control" when describing the MIS/information center relation. The interviewer is quickly steered to words such as "affiliation," "cooperation" and "partnership."

What MIS gives with one hand, it seems to take back with the other. A recent study by Crwth Computer Coursewares in Los Angeles indicates that a majority (more than 60%) of info center personnel who leave their positions climb back into MIS as technicians or managers.

That is the route Pat Cupoli took. As the Business Systems specialist at Rolling Meadows, Ill.-based Northrop Corp., Cupoli is excited about her plan known as "Information Warehouse," which will identify and gather corporate data and place it in the hands of end users.

Cupoli says she will use her info center analyst skills in her new position to coordinate the plan with the information center and Northrop end users.

"The information center is coming out of its traditional role of data administration and is entering a second phase of helping people put together systems that will help change companies," Cupoli explains. "That means more direct consulting, not just the ad hoc stuff that info centers have been doing."

Cupoli says she would eventually like to return to an info center, but this time as manager.

Ojars Strauss, a user center consultant with Cenex/Land-O-Lakes AG Services in Inver Grove Heights, Minn., was teaching foreign languages before changing careers in midstream to become first a programmer then an information center staff member.

"I think the variety of experience has helped me," Strauss claims. "It wasn't so long ago that I felt helpless in front of a computer. That tends to get you closer to users."

Although Strauss and Cupoli, a former librarian, each came from non-computer-work backgrounds, they first passed through the MIS mills before entering the information center world, a well-traveled route.

The opposite journey appears less popular. MIS might welcome back its own, but it seems to turn a cold recruitment shoulder to those information center employees without MIS backgrounds.

"In my experience, information center people who come from a PC user background will have a rough time getting into MIS," says Lou Vogel, an information center manager and manager of systems development at Georgia Gulf Corp. in Baton Rouge, La.

"MIS is still a mainframe domain. The talents that information center people with PC user backgrounds bring with them probably won't be right for MIS. Of course, that reasoning can apply to a mainframe person going into the user department. Both parties might have the right talent but not the right training," he says.

From where Virginia Talamo sits, the view for information center career opportunities is not too bright right now. Talamo, like Vogel, wears two hats; one as microcomputer manager at Coopers & Lybrand's head office in New York and another as public relations coordinator and treasurer for the Microcomputer Managers Association.

Back in gear

Talamo, who recently convened a gathering of career counselors, recruiters and human resources personnel, says these professionals painted a picture of an info center industry just beginning to get back into gear. Though Talamo qualifies that micro managers are not necessarily working with or within info centers at some companies, she says many such managers have information center backgrounds. She, therefore, claims her comments are valid for most corporate info centers.

"There has been a change following the [PC] purchasing slump," Talamo says. "Our perception has been of a market for fewer [job] opportunities and a compression of salaries. When you're in demand, salaries increase. The demand isn't there yet, though there are bright signs."

One encouraging sign is the creation of more coordinator-type jobs, an occurrence that Talamo says is placing staff from information centers or MIS directly into the end-user community, somewhat analogous to Schaeffer's business analysts. The Crwth study indicates that almost 40% of information center personnel see opportunities of eventually finding their way to full-time consultant and manager positions in the user community.

"Companies are buying more PCs again," Talamo says. "Behind that, I see MIS [managers] suddenly taking a longer look at PCs and noticing how important the machines are to companies. They also know that they [MIS] are often not the best people to handle this situation. They are slowly giving information centers more freedom to try interesting things with users. That will lead to some interesting career paths."

Dramatic change

Paul Schapira agrees.

"Info centers have changed so dramatically," says Schapira, information data base manager at Woburn, Mass.-based Marshalls, Inc. "When I attended the first information center conference in Boston in 1984, about 90% of the topics concerned mainframes. Now, I'd say 70% are PC related. End-user departments want some expertise right there [in the department]. Rather than waiting for an information center backlog, they'll get a person in from the center or from the outside, and if the department is big enough, that person will stay. These guys become analysts, they develop programs, they troubleshoot and they keep up with current technology. It's a whole new position."

Peter Carino, information center manager at the University of Massachusetts at Amherst, calmed the concerns of his information center staff by assigning them titles reflecting their MIS background.

"We're a vanilla information center. We do everything other information centers do, except we don't have office automation planners, resource planners and hot-line attendants like other information centers," Carino explains. "We have project managers, analysts and programmers, instead. We've set up consulting contracts with our user community. Last quarter, out of 600 contracts with user departments, 40% of those contracts were for consulting purposes. Arranging such contracts and working under a set of MIS titles is a solution to some of the morale and promotion concerns that are sometimes inbred with information centers."

Carino thinks that another big part of keeping information center employee morale on the upswing is having the staff involved in current technology.

Heavy involvement

"We have requests for proposals under way on a campus [Integrated Services Digital Network] installation, and there is talk of bringing in fourth-generation languages," Carino says. "When those things reach the end users, we'll be heavily involved. Maybe we'll change the info center organization to meet these new technologies. We'll see. I think a lot of centers are reaching the stage where they can experiment with their staff positions in relation to changes in new technology."

In a political light, however, Talamo cautions against equating greater freedom to experiment with greater autonomy.

"There is now a very strong user pull toward PC connectivity through networking and micro-to-mainframe links," she says. "Much of that is running counter to information center autonomy because MIS is firmly in the driver's seat in both services, and both services are becoming very important."

They are getting so important, Talamo says, that in some cases info centers and micro managers are being joined closer to MIS to organize connectivity better.

"I can see cases in which MIS decides to staff end-user coordinators directly from their own ranks, bypassing the information center and user communities," Talamo adds.

Not all the resistance will come from MIS.

"People in information centers tend to be naive," says William Sebrell, director of technical education at the Hartford Insurance in Hartford, Conn. "They are not the instruments of change they tend to believe [they are] nor that IBM wants them to believe [they are]."

> **"People in information centers tend to be naive. They are not the instruments of change they tend to believe [they are] nor that IBM wants them to believe [they are]."**
>
> WILLIAM SEBRELL
> HARTFORD INSURANCE

In the eyes of Sebrell, many information centers would do much better and increase their chances of future survival if they concentrate on training, one of the info center's traditional mainstays.

"Most info centers do not realize that many end-user problems can be solved through adequate training," Sebrell explains. "We have three levels of training here, from stand-up lectures to off-the-shelf software training packages. Most naive information centers remain stuck at the first level. At a certain stage, I think the future of every info center becomes a training issue. I see so many centers that have to bring in high-priced outside consultants to put through projects the info center thought it could handle. They don't realize that many of the problems can be solved through better training."

Following Sebrell's philosophy, it is no surprise that Hartford Insurance's information center is almost exclusively made up of dedicated trainers. And almost all have arrived by way of the company's MIS department.

What does that mean for information center career advancement at Hartford?

"I tell all trainers coming in that I expect them to be here for three years," Sebrell says. "After that, they can move back into MIS, or we can retrain them for some other work field they are interested in. I don't see anyone [from the information center] finding a position in the user community."

A shortage of skilled information center staff for training positions has created a large private industry of computer-based training packages and instructors. In the Crwth survey, a vast majority of information centers still listed training as a top priority, and nearly half said they were hampered by a lack of available trainers.

It seems clear that although many centers are making conscious efforts to move away from end-user training and support, the two still loom large in the info center psyche.

Northrop's Cupoli cautions information centers, however, against staying too pat with traditional training and support functions.

"As information centers grow, their emphasis has to be more on consulting," she says. "I know that's what our end users are coming to us for. And that's what will open information center career doors in the future."

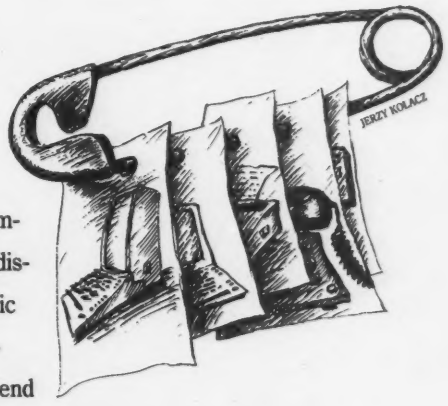
And anyway, Marshalls' Schapira explains, info centers are simply too young yet to enable researchers to get a good handle on where information center career paths are leading.

"That's especially true for information center managers like myself," he says. "Who knows where we'll wind up? In a way, it's like when I was teaching. 'Old teachers never die,' we used to say, 'they just lose their class.'" ❖

STRUCTURAL STRATEGIES

Info center organized along new lines

BY THEODORE KLEIN



Senior management today recognizes that end-user computing and related forms of distributed computing are undergoing dramatic changes. As decentralized technologies improve far beyond initial expectations and as end users grow increasingly computer literate, a tremendous potential emerges for exploiting these technologies for a corporate and personal advantage.

Information centers are not immune to this upheaval. Currently, mature information centers are witnessing a transition from personal computers to departmental computing, presenting a means of tapping technological potential for corporate benefit.

Consider the information center as a clearly defined business unit providing a portfolio of consulting and technical services to the end-user computing community. For example, most information centers offer a broad range of support, in the form of newsletters, product acquisition, end-user classes, libraries, data downloads and, perhaps, even hardware and network installation. Most often, however, the services an information center provides are a function of its maturity and the expanding capabilities and sophistication of its staff and client community.

For each service that an information center provides, two attributes can be identified — a service orientation and a service level degree.

There are a range of service orientations, which can be classified into passive or active modes. A passive information center's service objective is to increase an end user's self-sufficiency by training him in a particular software package, for example. By contrast, an active service is oriented toward direct involvement or assistance for users by installing hardware or acquiring software for them, for example.

The other attribute of info center services is the service level degree, which is measured by the amount of time and effort it takes for the info center to perform a service. Unfocused, quick and superficial services include putting out a newsletter, maintaining a software library and setting up a hot line. More focused, lengthy and in-depth center services include arranging for data extracts, coordinating vendors and creating system development guidelines for users.

By examining how these two attributes apply to an information center, one can chart the center's growth from infancy through adolescence and into maturity.

Most start-up information centers begin as small groups, perhaps with a single part-time individual and with limited mainframe support. This "young" info center then usually expands its responsibilities to include setting up a library, publishing a newsletter, offering initial Lotus Development Corp. 1-2-3 or personal computing training and, perhaps, staffing a hot line.

However, just as the information center grows capable of effectively providing these services, end users begin clamoring for more sophisticated, often mainframe-based services. To cope, the center evolves and adds staff, increases its software product library, makes micro-mainframe links available, begins to research and prescribe mainframe fourth-generation languages, facilitates data extracts and downloads and arranges for the corporate

Klein is president of the Boston-based Boston Systems Group, Inc., a management consulting and systems development firm. He previously served on the graduate faculty at Boston University.

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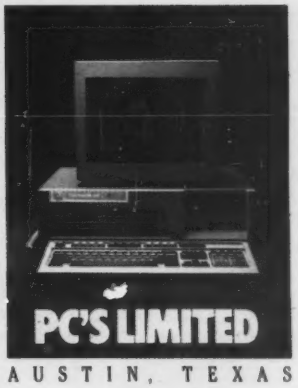

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coordination and volume purchase of software packages.

The range of these extended services is hailed by end users, but they still want more. So the information center takes on another set of responsibilities, becoming decentralized and minicomputer-based, creating PC applications development guidelines, arranging for the installation of multiuser local-area networks (LAN) and, perhaps, even undertaking direct responsibility for applications development. At this point, the information center has reached maturity.

Inevitably, the success of the information center contributes to its extinction. As information centers assist in educating end users, fostering an atmosphere of distributed microcomputer growth and providing a wealth of technical and problem-solving support, end users become sophisticated users.

Ultimately, end users will identify complex departmental problems and, without recognizing the implications of their actions, begin to develop complex departmental software. This software often may take the form of "monster spreadsheets," complicated and undocumented data base systems or convoluted data entry and reporting procedures often developed using flexible and powerful fourth-generation languages.

Often, the information center does not recognize the monster it has created and has been naively feeding. However, systems professionals have long realized the important distinction between single-user systems and corporate systems.

Keeping a broad view

Development issues such as data integrity, system administration, design modularity, maintainability and technical migration paths are foremost in system designers' minds. Furthermore, there are a wide variety of controls, procedures and mechanisms in place to ensure the long-term integrity of institutional systems that often outlive their designers, developers and administrators. End users are not used to thinking this way.

Information centers are not just for personal computers anymore. They represent a transitory link between end-user computing and decentralized, sophisticated departmental systems that will serve the needs of the corporation for the remainder of the century.

To deal with this challenge, MIS departments must effectively address the issues of distinguishing between distributed end-user systems that serve the unique needs of the individual and decentralized systems that serve the broader needs of the corporation.

There are five telltale signs as information centers emerge from merely helping the end user with his PC to taking on more sophisticated, departmental responsibilities. These signs point to this transition in philosophy, and MIS managers would be well advised to recognize them.

Driven by increased end-user expertise, the first transitional indicator is the development of small, informal information centers emerging from the technical sophistication of one or two end users. These end users take on more technical work, often on their own time but occasionally at the expense of their other duties. Because of the richness of their direct experiences, these users quickly outpace the technical expertise of the info center and rapidly become known as resident technical experts.

Inevitably, the success of the information center contributes to its extinction.

Other department members flock to these knowledgeable users with their technical problems, often because of the experts' unique location within the user department. As a consequence, such resident technical experts are often in an enviable position, able to assess, identify and initialize complex systems development efforts well beyond MIS's reach and control.

Businesses and managers increasingly are calling on technology to help fight the competition and improve productivity. And as functional management deals with technology, it gains valuable insight and knowledge. No longer is the MIS/DP department called on to simply automate a process.

Instead, senior marketing, production and financial management, often with little computer knowledge, are wresting from MIS the action of identifying and utilizing decentralized PCs. This increased awareness, participation and desire for control is another sign that functional management wants to utilize decentralized technologies to maximize productivity.

A third indication of the decentralized computing evolution is the large concentration of sophisticated computing power by a single end user. Often, this sign manifests itself in the proliferation of PCs in a department, in an increase in the need for processing capability, in the desire for greater amounts of on-line file storage and in the perceived need for sophisticated microcomputer-to-mainframe communications.

The desire for lateral communications becomes the fourth sign of the move toward decentralization. As end-user abilities increase, a perceived need for intradepartmental communications emerges, which is the driving force behind the installation of many LANs. Despite the fact that most LANs provide only minimal electronic mail and device-sharing facilities, their installation continues at a rapid pace. The articulated and cost-justified need for these networks is a key sign that end users have become more sophisticated in the use of decentralized technology.

A fifth and final signal that end users have evolved beyond the initial stages of individual PC use is the realization that without some measure of help, successful development of complex systems remains out of their reach, no matter how well-versed in technology they may be.

Whereas before only systems professionals recognized the overall effects of changes to end-user systems, mature users now understand that departmental systems cross individual and work group boundaries and, as a consequence, introduce complicated political and organizational change issues that they cannot handle alone. Users must enlist the help of professionals with the ability to manage such change through consensus-building and maintaining an objective perspective.

The evolution of the information center function is inevitable. The two key forces that affect this change are personnel and more powerful and capable software tools.

There are five classes of personnel that could potentially develop information systems, as follows:

- The end consumer. This end user generally has minimal experience in systems development and little interest in the technology. However, such a person can aptly use a variety of data manipulation and spreadsheet tools.
- Business analyst. This user typically has a small amount of technical experience and some capability to do minor amounts of systems development.
- User/developer. This user has a moderate amount of development capability and is often well-versed in the technology. Armed with a business or computer science degree, the user/developer is capable of undertaking sophisticated systems development.
- Applications programmer. This type of computer user focuses strictly on information systems development. He may have direct development responsibilities and substantial technical experience.
- Experienced programmer. Often extremely knowledgeable in software development, this user has a highly technical focus.

Most often, the information center is staffed with individuals with backgrounds in applications programming or with skills similar to what a user/developer might possess. However, all large organizations are experiencing a substantial amount of interdepartmental movement between these groups.

The educational and technical distinctions between groups will diminish over time as end users grow much more sophisticated in their use of technology and as trained systems professionals find themselves on more business-oriented career tracks.

Powerful advances

In addition to the rapid changes occurring in personnel capabilities, tremendous advances have been made in the speed, flexibility and power of software tools, such as filing or spreadsheet programs; end-user relational data base languages; fourth-generation packages; programming tools and languages; and assembler or C programming and sophisticated data base systems.

Today's new hardware and software technologies have provided even the most novice personnel with capable tools to develop sophisticated information systems. Considering Apple Computer, Inc.'s recent Hypercard announcement for the Macintosh, which provides users associative access to files and applications, this trend is far from over. The combination of personnel changes and influx of powerful and useful development tools are easing the shift to decentralization in info centers.

What happens when the right mix of the aforementioned personnel and technology occurs?

Traditionally, MIS-oriented personnel, often led by technically sophisticated and professionally trained software developers, use advanced programming languages, mainframe technologies and traditional, structured methodologies for institutional systems development. Meanwhile, individual end users use fourth-generation, spreadsheet and related software tools primarily to develop a broad range of individual and work group systems.

However, the delineating lines between end users and MIS are blurring. Increasingly sophisticated end users are developing systems that rival the mainframe in complexity. These users read programming books, take evening computer classes and practice their craft until they rival the professional developer in terms of technical development skills.

On the other side, many professional software developers from MIS departments are enamored with the flexibility and power of fourth-generation languages and are considering such tools for development. Furthermore, many professional software developers, tired of the technical tedium of their job, are making career moves into business departments.

In the center of this rapidly evolving environment is the information center, which strives to educate end users while serving the broader needs of the MIS and corporate organization.

Five paramount issues soon become apparent in smoothing the transition from a mature information center to effective decentralized information systems departments. Organizations must develop guidelines and plans to address the following concerns:

- Strategic issues. What is the most appropriate balance between your centralized corporate information systems group and your soon-to-be established decentralized, departmental end-user groups, given your competition, corporate culture and unique staff capabilities?
- Architectural issues. How can your firm identify information system opportunities, and how does MIS ensure that these opportunities are channeled to the appropriate corporate or departmental staff for assessment and development?
- Technological issues. How are advances in hardware, software data base and communications technologies going to be dealt with by department computing staff? Is there a migration path for decentralized systems?
- Educational issues. How can your organization deal with the rapid increase in computer literacy among personnel, and how can you focus this expertise in the correct direction?
- Growth issues. How do you manage the growth of distributed applications as they become more sophisticated and corporate in nature, and how do you effectively disperse previously centralized mainframe systems?

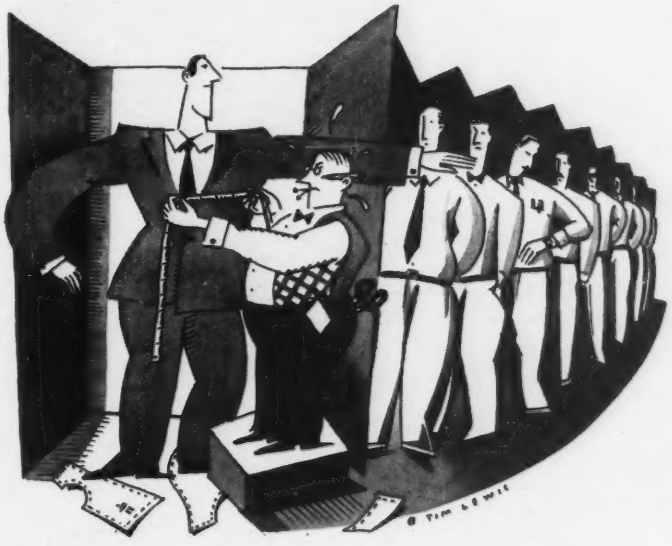
Difficult questions, indeed. But considering the vast potential afforded by staff capabilities and by decentralized technologies, these are issues that companies will need to answer and address if today's corporation is going to succeed.

By training corporate staff, by assisting in identifying new opportunities and by fostering the use of new technologies in the corporate environment, the information center has, in effect, put itself out of business.

During the next 10 years, the evolution of the information center will bring about a new form of end-user, distributed and departmental computing. Fueled by rapid advances in powerful and flexible workstation technology, firms will find imaginative uses of micros as competitive weapons. Although much of corporate data will continue to remain in centralized data bases, distributed departmental processing will become a key means for achieving organizational advantage. The info center should be credited with laying the groundwork for this change. ❖

Coping with application demand

Info center managers tell their stories



BY REBECCA HURST

Developing applications for end users has put many information centers somewhere between the proverbial rock and a hard place. On one side, these centers are being asked to introduce an increasing variety of microcomputer hardware and software products. From the other side, they face growing demands to develop applications to work with these products. Given their often limited resources, information centers are finding that something has to give, and that something is usually software development.

Many information centers are building a small backlog of applications that mirror the unmet demand for larger system software confronting data processing centers. The irony of this situation is not missed by most information center managers, who recall that the centers were created to eliminate such backlogs.

Some managers argue that microcomputer applications development should be handed back to DP or MIS. Others say the information center is in the best position

Hurst is *Computerworld Focus*'s senior writer.

to create applications that meet micro users' needs. However, managers offer several caveats concerning management support, duty distinctions and software development limitations. Most information center managers agree on one thing, however. Centers cannot continue to juggle development and support functions if they are to remain effective.

Fortune 500 case

An information center by another name, the end-user computing group of a Southwest Fortune 500 manufacturing firm shares many of the application development responsibilities and problems facing info centers. Created early this year from several satellite systems groups, the centralized end-user computing group already faces a six-month backlog.

That type of backlog is likely to get worse, predicts Gerald Hynes, supervisor of management systems for Allied-Signal, Inc.'s Bendix Kansas City Division in Missouri. First, programming accounts for only part of the time required by an application; the other part is maintenance, he says. "Programmers may think they're through when they've finished a project, but in two weeks or six months, the user is going to need changes to the software."

A second problem is limited staff size. "Most information centers are understaffed," Hynes claims. His own staff includes four personal computer specialists who provide information center services. These specialists are responsible for almost 650 micros, he notes. "Our company has added 150 PCs per year," Hynes says. "At that rate, four people will be supporting almost 800 systems in 1988." With these limited staff resources, it is difficult to allocate staff members to programming projects, he comments.

Four years ago, when the PC user community was small, it was difficult for Hynes's staff to realize that they had limited resources. "They thought they could provide help and programming for everybody," he recalls. "They have since realized that they have a hard enough time providing everyone with support." Therefore, Hynes warns information centers to avoid programming before they realize that they cannot keep it up.

The manufacturing firm's end-user computing manager, who has an 11-person staff, acknowledges that providing support and application development services can tax the group's resources. However, everyone performs both services at her company, she says. "People become bored just providing support," she says.

Hynes agrees. "Our group started out as a scientific programming unit that wrote in Fortran," he recalls. "It has been difficult for these programmers to move into a support role, and it's hard for them to turn down an application request." In many cases, when programmers ask to develop end-user software, Hynes reminds them that they will be responsible for its support. "I tell them that they're tied to it 'til death do you part," he says. Understanding the implications, programmers usually choose not to write the application.

There are occasional exceptions to the

Gerald Hynes

rules, Hynes says. If a programmer can write an application in less than two days and it will not require further support, Hynes allows the programmer to take on the project. "This pacifies the programmers and the users," he notes.

Boredom is not the only argument for sharing support and development functions. Another factor is expertise, according to the end-user computing manager at the Southwest manufacturing firm. "I don't see how people can support products unless they use them," she comments. "Because we develop applications, we are more on top of the software than the users are."

Handling development helps the information center staff support end users better, concurs Alice Allen, a contractor for the Environmental Protection Agency (EPA) and head of the information center at its Pesticide Programs Office in Crystal City, Va. However, the staff should not handle both duties at the same time, she says. "It's hard to develop an application when you are being interrupted by support questions."

Ideally, the information center should assign support to one-half of the center's staff and development to the other half, Allen says. These two groups should then switch duties, perhaps every six months. Developing applications with software packages such as Lotus Development Corp.'s 1-2-3 or Ashton-Tate's Dbase III is the only way to know them thoroughly, she says. At the same time, Allen notes, "supporting users gives the staff a better idea of users' needs, and they can bring this knowledge into developing applications."

While the application development

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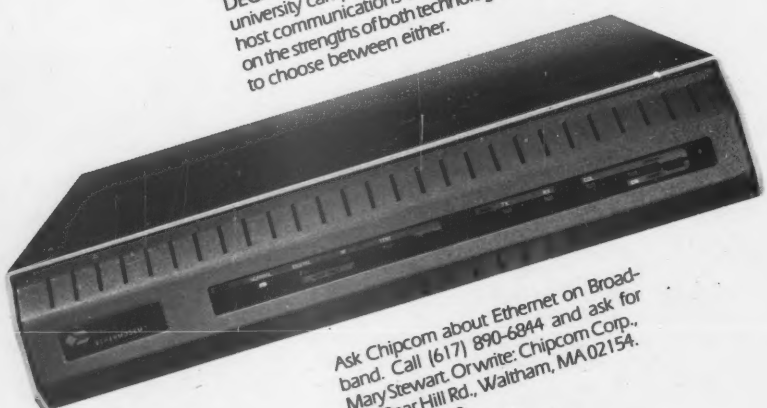

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group would be most effective working as part of the information center, a second choice is having a microcomputer software group in the data processing department, Allen says. Most companies have separate minicomputer and mainframe application groups, she notes. "I don't see why it would be any different for micros."

Farming out microcomputer application development to an existing programming department might be acceptable once, even though the group probably has the wrong technical expertise, Allen comments. "This is not the most effective way to cross-train programmers, though." Instead, managers need to establish a microcomputing group and coordinate its activities with the rest of DP, she suggests.

The EPA has chosen to handle micro applications in its central DP office in Washington, D.C., Allen notes. This central group takes on application projects that users lack the time or expertise to

Alice Allen

handle. For example, one user had written an application so large that he essentially became a DP person to maintain it, Allen recalls. "He came to me and said, 'I'm a biologist, not a programmer.' " The application has been moved to the DP branch, she notes.

Simpler applications can and should be written by end users, all three managers agree. However, they differ in the extent to which users should be responsible for their own applications and the methods for encouraging user development.

At the Southwest company, users who write their own applications or data base reports are more the exception than the rule. Some of the departments of the company have their own data management groups and require little support, the Southwest end-user computing manager notes. Others do not want or cannot afford to allocate technical people, she says. "Very few departments do their own development."

The end-user computing group has had mixed results in trying to meet users halfway. "The best compromise is one in which we set up the application and then the users can use it to write all the reports they want," the group's manager explains. "Programmers like to write applications," she says. "They don't care about working with the data." Getting a majority of the users to join in this compromise is still a future goal, however.

Allied-Signal handles software development quite differently. Users are responsible for a majority of the applications they use, Hynes states. "Only a few users are adamantly against programming."

For complicated programs, the PC specialists will provide the background technical program and let users finish the application by inputting information and adding features such as interfaces and menus. In addition, users are solely responsible for upgrading and maintaining the software, Hynes asserts.

The Bendix division of Allied-Signal also has extended end-user support by establishing a network of local expert users. Echoing the manufacturing company manager, Hynes notes that users are the experts on the content of their applications. "We beat our brains trying to understand what they are doing in their departments."

Looking at Bendix's nine divisions and the subsections within each division, Hynes's group made a list of people who wanted to participate in the local expert program. From this list, Hynes established an expert for each section. "It's important that these experts join because they want to and not because they have to," he notes.

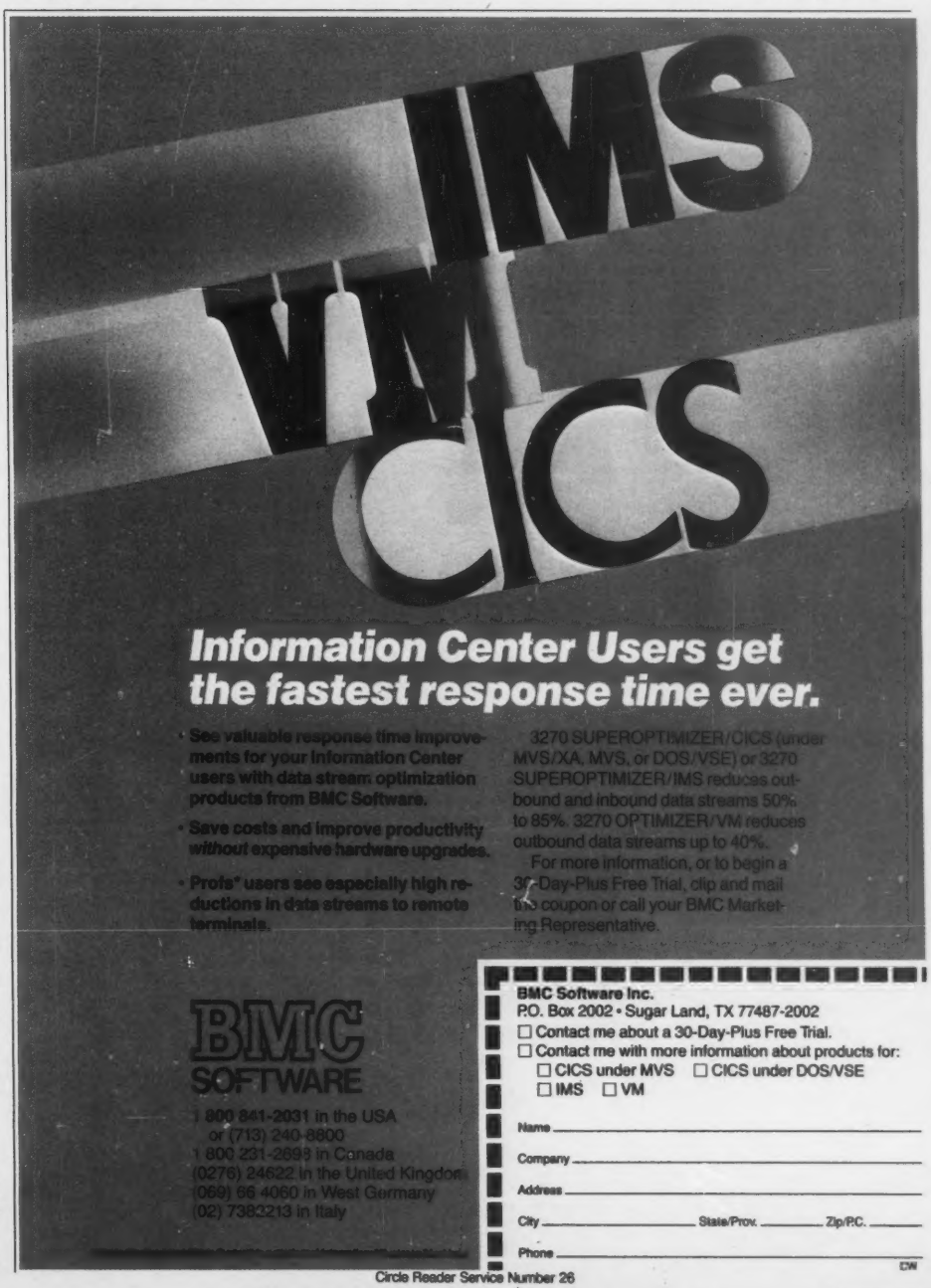
Knowledgeable insider

In this way, users can turn to someone who knows about their business for advice. "We have experts in spreadsheets and word processing, and soon we'll have them for graphics and data bases," Hynes notes. However, he emphasizes that, like the PC specialists, the experts are not to write programs for their co-workers. "So far, we have been operating pretty successfully," he says.

The EPA Pesticide Programs Office provides a similar but less structured system of procedures. Like Allied-Signal, it has a large number of users who write their own applications, Allen reports. The information center provides users with assistance in writing applications but will not take over a project. Instead, if a user does not have the background to write an application, Allen tries to offer several alternatives.

For example, if a novice user from the Science Support branch comes to the information center, Allen will try to see if someone has developed a similar application that can be modified. She may also look back to the user's department.

"I'll say, 'I can't develop this in the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information center, but I know someone in Science Support who can program in Dbase,' " she explains. "I'll then go to the department manager and explain that this is the fastest way to get the software written," she says.

If the application is more than the Science Support expert user can handle or if that user does not have time to write it, Allen instructs the department to file a request with DP to write the software. The microcomputer programmers in the EPA's data processing department are familiar with Dbase and can code the software quickly because they do not program EPA-wide systems, she notes.

However, "Users in a department can develop a better product because they are familiar with the data and how to manipulate it," Allen asserts. The novice user and the department guru speak the same language so there is less confusion in communications. "That's the whole thrust of end-user computing."

Application writing advice

To help users develop their expertise, all three managers report that they offer users advice in writing applications. They also provide varying levels of training. The Southwest end-user computing group offers personal training on an ad hoc basis. "The company has a training group that provides classes," the Southwest manager explains.

Although Hynes's staff is not a training organization, he reports that the support group provides a mixture of training services. The group has developed in-house introductory classes for the products that it supports, Hynes says. "We'll offer users help getting started with the primary software on their system," he explains. For more specific computer classes, the company relies on outside trainers.

For users who do not have the time to attend classes, Hynes' support staff provides self-help training tools. First, the staff has written books that introduce users to the computer system. Second, the group provides computer-based training programs. Together, the mix of self-training aids and classes has given Allied-Signal the best results, he reports.

Users at the Pesticide Programs Office can get training locally or at the central EPA office, Allen reports. "The central information center offers full-day classes for a fee, and the information center here provides free seminars," she explains. Allen's seminars include classes in programming and maintaining data bases as well as data base report writing, she notes. "A lot of people know how to code, but they have a problem creating reports," Allen comments.

Even with training programs and support, Hynes and Allen report that they still occasionally are required to write applications. When upper management requests that they write a piece of software, they have to write it if they want to keep their jobs, both say. However, they report that such requests are rare. By contrast, the group at the Southwest manufacturing company regularly writes applications.

The difference appears to reflect each manager's upper management support. The Southwest company has determined that software development is part of the end-user computing group's charter. Hynes's and Allen's groups were formed to provide support. In addition, both have a great deal of management support.

Allen's information center has benefitted from the EPA's emphasis on using technology. "Upper management in the EPA has been very aggressive in getting technology to users," she notes. "Management is, perhaps, more sensitive than others in the organization."

For example, the head of the Pesticide Programs Office gave a newsletter interview stating that he wants managers to have the same access to information residing on computers that he has, Allen says. "When someone like that makes a statement, it filters down through the organization."

Sensitizing management

However, it is the information center's responsibility to educate management, Allen says. "They need to be sensitized to such issues as understanding the learning curve and application development time." Methods for informing managers can include newsletters, small tours through the information center, an open house or management training classes, she says. One info center head has developed a management series of courses that includes management issues in microcomputing, managing time and budgeting with a micro, Allen notes.

Allied-Signal's microcomputer support staff has even more direct support. "We have been lucky because our manager was spawned from our group," Hynes says. "He understands a lot of our problems." Even so, his support staff also has had to educate other managers.

Many users were first reluctant to do their own programming and would turn to their managers to have the support group write the applications. In response, the support group had to explain to management that X amount of people could only do so much for X amount of computers. "They were sympathetic to our logic."

Eventually, Hynes recalls, "Users were going to management too often, and managers became aware of our problems in handling their requests." With management no longer backing them, users turned to the support staff and said, "OK, give us some training," he says. "And I replied, 'What kind do you want?' " ❖

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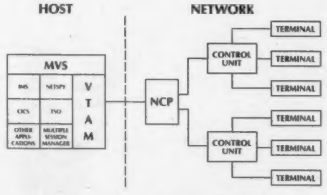

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PURCHASING PROBLEMS

The perils of desktop publishing

BY REBECCA HURST

It's a beaut! The terminal displays brilliant high-resolution graphics. The software handles multiple columns and true what-you-see-is-what-you-get versions of a page. The laser printer even prints color separations. This dream desktop publishing system stands poised, inviting you to take the helm.

Even if you, as an information center manager, are not drawn in by this vision of high-tech personal publishing, you may find yourself pushed in by the demands of your end users. Either way, proceed with caution. The simplicity suggested by desktop publishing's slick and visually enticing veneer belies the complexity of the system beneath.

The software for desktop publishing packages is often more complicated than for other applications, and related publishing products carry subtle requirements that most users will not fathom. Beyond the technology, you also find a deep sea of publishing-related problems including education, quality standards and management control. To manage desktop publishing successfully, information center managers need to consider each of these areas, looking for potential pitfalls and ways to avoid them.

The first step information center managers need to take is deciding what publishing products to purchase and support. "Most people looking at desktop publishing don't know what they need," says Daniel Will-Harris, a Los Angeles-based electronic publishing consultant who recently wrote the book, *Desktop Publishing With Style.*

"I see beginners frustrated by a publishing package because it doesn't do what they want it to, and they stop using it," Will-Harris says. "They think desktop publishing is all hype." Such users usually are willing to give the technology a second try, though, he reports. "When I show users that they were just using the wrong software, they get excited using the new package," Will-Harris says.

Even the two leading page layout programs, Aldus Corp.'s Pagemaker and Xerox Corp.'s Ventura Publisher, vary significantly in the types of publishing features they offer. Pagemaker allows users to move the process of manual pasteup onto a computer screen, Will-Harris notes. However, it does not automate the design or layout of the page, a process that can pose a problem for many users. "Layout is an art," he says. "Therefore, users who are not graphic artists may not have the necessary design skills to use Pagemaker."

Ventura Publisher is more complex than Pagemaker in some ways, but it can be easier for users to work with. Ventura was created around the idea of producing style guides, Will-Harris explains. Artists can use Ventura to design style sheets for users, who then need to know little more than word processing to create documents, he says. These artists can come from a company's own publishing department or from an outside consultancy.

In addition to getting the right products, info center managers need to consider all the basic components that form a desktop publishing system. Most users envision only three components when they think of desktop publishing: a computer, page layout software and laser printers. This incomplete view sets users up for potential problems with capacity and compatibility.

By observing certain hardware and software requirements, information center managers and users can avoid such problems, according to Howard Hillman, publisher of Howard Hillman Publications in New York. These requirements include utilizing industry standards as means of ensuring product quality, he says. At the same time, Hillman notes that the best system is one tailored to users' needs, and these needs may sometimes require nonstandard products.

The first step to tailoring a system is to choose a hardware platform. Managers should look at the Apple Computer, Inc. Macintosh series microcomputers or IBM Personal Computer ATs or compatibles, Hillman recommends. These computers need to be

Hurst is *Computerworld Focus*'s senior writer.

PURCHASING PROBLEMS

outfitted with at least 30M bytes of hard-disk space because publishing programs are memory hungry, he says. Also, managers with PC ATs or compatibles should increase main memory to 2M bytes. "Otherwise, the publishing software will slow down the systems' operation considerably," he claims.

Other hardware considerations

Beyond the computer itself, other hardware considerations include the monitor, laser printer and scanner. At a minimum, the PC monitor should include enhanced graphics adapter graphics, Hillman says. "Color is an advantage," he adds. "Many of the new page layout applications use color guides to help position elements on the page." The No. 1 PC monitor standard is NEC Corp.'s Multisynch, Hillman notes.

Although Macintoshes come with their own monitors, managers can connect a Mac to a variety of large-screen monitors from third-party vendors. These terminals can simultaneously display one or two full pages at resolutions up to 1,600 pixels in either monochrome or color. There are as yet no clear standards for these units.

Laser printers need a minimum of 2M to 4M bytes of memory because storing type fonts and graphics eats up a lot of memory, Hillman says. "Users who use the laser printer as an expensive typewriter can get away with 2M bytes," he explains. However, "Anyone using a lot of full-page graphics needs 4M bytes." Hewlett-Packard Co.'s Laserjet series is the standard laser printer for PCs, Hillman claims. The standard for Macintoshes, though, is Apple's own Laserwriter, he says.

Additionally, info center managers should consider a scanner, which can save a company the time and cost of using an illustrator, Hillman suggests. These devices scan photos, artwork or text and store them in files within the computer. Users can then call up these files and import the graphics into their documents. HP's Scanjet flatbed scanner is a good choice because many software products support it, he says.

Can scan 3D objects

Hillman recommends users choose flatbed scanners like HP's model because they offer users more flexibility than sheet-fed models. "With a flatbed, you can scan books or other three-dimensional objects," he notes. In choosing a scanner, managers should also look for models that include an optical character reader (OCR) or optical character recognition software that will work with the scanner. "A scanner can read in text, but it stores it as a graphics image," Hillman says. "The OCR reads and records text as text."

Along with hardware, info center managers need to look at their software options. These include page layout, word processing, windowing, painting and drawing programs as well as typefaces.

Hillman advises buying popular word processing applications because page layout programs are more likely to support text import and export facilities for these packages. Microsoft Corp.'s Microsoft Word is a standard program for both PCs and Macintoshes, Hillman says. However, he says, "I would not switch to Microsoft Word if my company already has a word processing package that works with the system."

Windowing packages also are an important consideration for PC and compatible users, Hillman comments. Microsoft Windows is becoming a standard for various programs, and it is the graphics interface product that works with Aldus Pagemaker, he notes. At the same time, some products such as Ventura are based on Digital Research, Inc.'s Graphical Environment Manager windowing interface.

Users are also likely to need paint and draw packages, Hillman says. These tools allow users to create original graphics. Standard products for the PC include Z-Soft Corp.'s Publisher's Paintbrush and Micrographix's Window Draw. Macintosh standards include Apple's Macdraw and Macpaint packages.

Finally, managers need to consider what typefaces they want to support. Laser printers such as the Laserjet include cartridges of common typeface fonts including Helvetica and Times Roman. Users may require additional downloadable fonts to provide a greater variety in sizes or type styles.

Some vendors' fonts vary

However, info center managers must check that fonts from different vendors are interchangeable, Hillman warns. "Different versions of typefaces have slight variations," he says. Standard typefaces are available from many firms including Bitstream, Inc., Polaris Software and Adobe Systems, Inc., he notes.

Once info center managers choose the tools they will support, they face the challenge of getting users to utilize desktop publishing products correctly and to the company's advantage. The first problem managers are likely to face is making business management understand the educational demands of electronic publishing, says Naomi Karten, president of Karten Associates, a Randolph, Mass.-based management consulting firm.

To dispell any misperceptions, information center managers need to hold an informal forum or class and convey to business managers that no computer learning is automatic, Karten suggests. The information center also needs to explain that publishing products are more

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complex than many other applications, she says. Given this knowledge, business managers must decide if the benefits are worth the cost in either internal or external training and the users' learning curve.

Temper expectations

Similarly, the information center has to temper managers' and users' expectations about the productivity gains that desktop publishing systems provide. "Take the amount of time you expect a project to last and double it," Will-Harris advises. While publishing programs automate some aspects of page production, users still have to put in a lot of work, concurs Toni Will-Harris, who helped her husband, Daniel, with the design and layout of his publishing book.

For instance, a five-page sample in *Desktop Publishing With Style* took Toni Will-Harris, a professional graphic artist, more than 10 hours to produce. Still, the process took less time than creating the pages manually, she recalls. Additionally, she says, "If I had to paste all the headlines and subheads manually, they would not have looked as good as they do."

A larger concern looming over information center managers is overseeing the proper use of desktop publishing systems. "Info center managers must decide who needs desktop publishing and where they should use it," Karten says.

Information center managers may also find themselves taking on the role of keepers of the company's graphics standards, suggests Suzanne Watzman, president of Watzman+Keyes Information Design, a Cambridge, Mass., design consulting firm. Given these responsibilities, info centers should examine potential publishing disasters.

Ooh, that's ugly

As previously noted, one danger of desktop publishing is that it gives the ability to determine style and aesthetics to people who are not skilled in making such decisions, Watzman notes. Compounding the problem is the lure of publishing that encourages people to experiment with all the system's functions. A result is that people are producing documents with multiple fonts, multiple type styles and multiple graphics elements, a mix that may not be visually and aesthetically pleasing, publishing experts agree.

Even if users have a good eye for design, they can hurt the corporation's image by expressing their individuality on company communications such as business proposals, announcements or letters, Watzman warns. "If you have 40 employees producing documents in 40 different styles, people outside the business will question the company's stability," she says.

Also, a good corporate design is based on performance, not just decoration, Watzman asserts. Beyond being attractive, the design must also make it easier for readers to understand the information a document contains. A design that fails to clarify the content can cost companies a lot of money, she says, especially if customers call a company's 800 assistance number to get adequate explanations.

If a company can trace the cost of bad documentation or marketing, it is easy to justify the price of establishing corporate standards, Watzman says.

Watzman urges that a professional graphics expert set the publishing guidelines for corporate communications. This expert can come from a publishing department within the organization or from an outside consulting firm. Either way, the graphics experts must also understand the capabilities and limitations of computer-aided publishing, she warns.

"I've seen cases in which a graphics designer came up with a design that the company's publishing system could not handle," Watzman recalls. As a result, desktop publishing users made ad hoc changes that the system could support. These changes negated the original reason for bringing in the designer, she says.

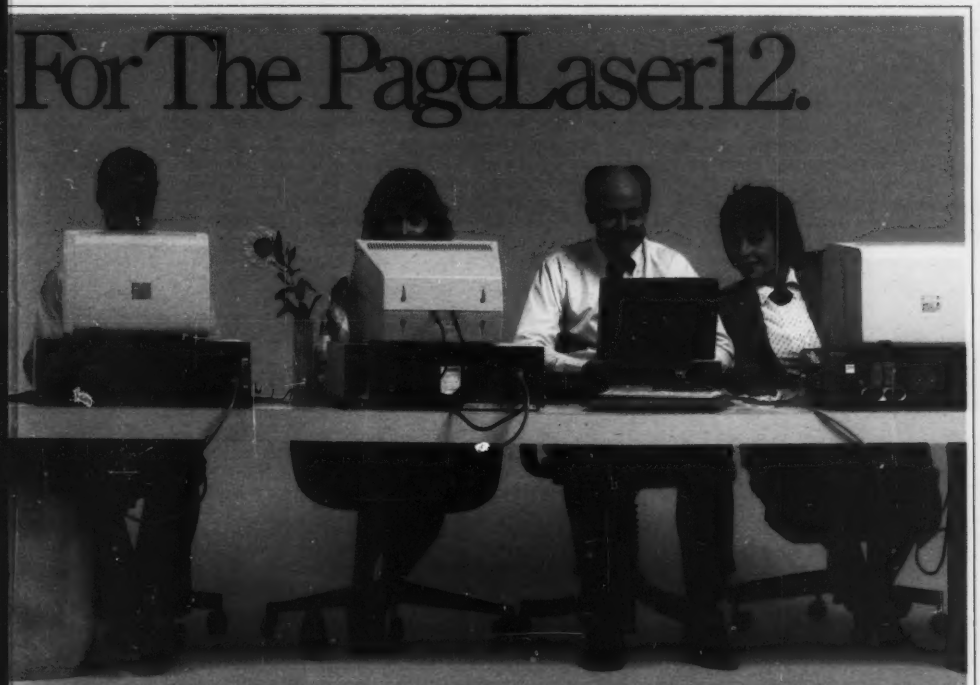
Writers, designers don't mix

Using guidelines, users need only worry about writing the text, Watzman says. To eliminate changes to formats, though, information center managers need to lock writers out of the format files, she says. By the same token, they need to lock designers out of the text files because writers or editors often overlook grammatical changes made by designers after the copy has been proofed.

As the keepers of standards, information center managers will do more than determine users' access to the desktop publishing systems; they will also maintain the graphic guidelines and templates, serving as advisors to users. Furthermore, info center managers may act as liaisons between the company and the designer, conveying corporate computing limitations and requesting additional format designs as employees find new uses for desktop publishing.

The role for information centers is a potentially weighty one, and at least one Fortune 500 company has hired a desktop publishing expert for its information center. Even if your company does not have enough publishing activity to warrant a resident expert, your information center staff may want to follow the example of Boston-based Bank of New England.

"We have not had much demand for desktop publishing, but I am sending my staff to an introductory seminar," says Paula O'Grady Collins, vice-president of the bank's microcomputer and information center support. "It's always better to be ahead of the users than behind." ❖



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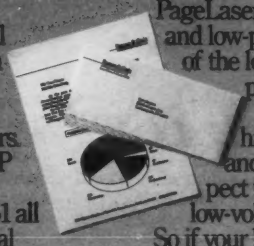

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TECH TALK

The ultimate user interface lies in an emotive machine

By Michael Tucker

Information center managers, MIS officers, the vendors of executive information systems and even end users are ultimately united by a single concern: how to bring the power of computers to nontechnical, and sometimes antitechnical, personnel.

These groups even agree on an answer: The path to making machines more accessible to humans is to make the computers handle more of their own management. Because we cannot afford to make every employee an expert in system administration, we must somehow reproduce that expertise in computers.

It is almost as though microcomputer vendors and managers must insert a tiny MIS department in each and every personal computer.

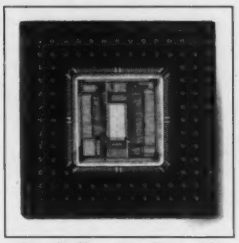
But how do we go about providing this machine self-management? Today, the MIS-department-in-a-box concept usually manifests itself as some kind of user-friendly, graphics-based interface, rather like the ones currently on the Apple Computer, Inc. Macintosh and the IBM Personal System/2. In the near future, these interfaces may be based on more exotic technologies, such as natural languages, three-dimensional graphics and so on.

Unisys gets tough with its departmental systems, page 42.

But the interface we really want goes beyond that; in fact, it almost goes beyond what we think of as computing technology. What we want is an interface that can learn about us, that can personalize itself to our own styles of work and behavior and that can become more of an associate and less of a device.

That goal is going to be tricky to accomplish. But there are tools coming to market that could make it possible.

For example, for years people have talked about applying artificial intelligence techniques to PC interfaces. This application hasn't been done much, partly because of limits on what you can do with traditional AI technology.



Symbolics, Inc. *Ivory chip*

There is now, in fact, a revisionist movement among some computer scientists that argues that AI has been misunderstood from its beginnings. This group feels that while AI techiques are unsurpassed at reproducing linear logic, AI is not very good at such processes as pattern recognition and vague, associative thinking.

This is why, these revisionists say, AI's commercial success has been in expert systems, which deal with problems that are highly linear, while it has been a relative failure in such areas as robotics.

However, the far greater reason for AI's absence from PC interfaces has to do with the lack of power of PCs with 16-bit chips. Such devices have been fairly hard-pressed to run AI-based applications, much less support an AI-based interface.

AI shifts to PCs

But that situation is now changing. First, PCs are growing vastly more powerful — 32-bit personal computers are rapidly becoming, if not exactly the norm, then, at least, no longer rare. Second, exotic AI-related hardware is starting to shift down from dedicated workstations to PCs.

One company involved in the shift is Cambridge, Mass.-based Symbolics, Inc., a firm well-known for its symbolic processing workstations, which have traditionally been used for AI research.

This year, Symbolics announced that it was branching out from complete systems into the subsystem market. Specifically, the vendor introduced the Ivory chip, which the company claimed is a complete symbolic processor on a single chip.

Continued on page 40

PRODUCT CLOSE-UP

Mac tools challenge IBM

Apple Computer, Inc. in Cupertino, Calif., took advantage of August's Macworld Expo trade show in Boston to put a few shots across IBM's bow.

Among the event's numerous introductions were two Macintosh software packages that will be particularly offensive to Big Blue — Multifinder, a multitasking operating and windowing system for the Macintosh, and Hypercard, an information management system.

Both Apple products are geared to second-generation Macintoshes — that is, the Macintosh II, the Macintosh SE and the Macintosh Plus — with at least 1M byte of memory.

Multifinder is effectively what IBM and Microsoft Corp.'s OS/2 operating system and Microsoft's Windows would be if they were combined and available today.

The product is an extension of the Macintosh operating system that allows a user to run multiple applications in multiple windows at the same time. Users can even cut and paste material from one window and application to another window and application.

Hypercard stackware lets nontechnical users develop applications.

Moreover, Apple said that with appropriate hardware (a coprocessor based on an Intel Corp. microprocessor), users can run Microsoft MS-DOS applications in one window of a Macintosh screen and then transfer information from that screen to a Mac application running in another.

At the press conference unveiling Multifinder, for example, an Apple spokesman cut data

Continued on page 41

BLUE BEAT

Apple's wily ways

Deidre Depke

Corporations have long been grappling with their policies on personal computer standardization.

For information centers, which deal with the issue of standards more directly than any MIS guru, the idea of standardizing technology is an especially important one.

The battle started almost as soon as PCs emerged on the marketplace.

User free-for-all

At first, users had a free-for-all. Corporate MIS departments, unconvinced that the micros would have any impact on their companies, exerted little control.

That situation soon changed, and a dictum followed: MIS departments decreed that their users would standardize around Microsoft Corp. MS-DOS-based IBM Personal Computers. Later, pressure from financial comptrollers altered that strategy to standardization around IBM or IBM-compatibles.

Then IBM threw everyone a curveball with its Personal System/2 line. MIS departments and information centers were back at the drawing board: Was it time to standardize around the PS/2? Should the MS-DOS standard be junked?

Meanwhile, upstairs on users desks, another machine began to appear. Users wanted something altogether different — the Apple Computer, Inc. Macintosh. Last August's Macworld Expo proved once and for all that the Macintosh has made it and

Continued on page 40

Intellisance CBT software debuts

BY MARY CHAVES
SPECIAL TO CW FOCUS

For the company with limited training resources, there is a welcome addition to the current library of computer-based training (CBT) software.

Intellisance Corp. in San Jose, Calif., has released the Expert Series Training Program for Lotus Development Corp.'s 1-2-3.

The program allows users to process (practice) the data so they can turn it into useful information, maximizing both learning and retention.

The vendor offers more than 30 CBT products in its library of Sudden Knowledge training packages.

Programs run the gamut from simple tutorials for packages such as Microstuf, Inc. Crosstalk and Ashton-Tate Dbase II to interactive programs that teach a user how to use the IBM Personal Computer XT or AT and Microsoft Corp. MS-DOS. Its expert training aids are also available for Ashton-Tate Dbase III and Dbase III Plus, IBM Displaywrite 3, Wordperfect Corp. Wordperfect and 1-2-3.

Chaves is the personal computer trainer at IDG Communications, Inc. in Framingham, Mass.

The whole library of Intellisance CBT software is categorized into three levels of interactiveness — Expert Series, Concurrent and Noncurrent.

Noncurrent programs are straight tutorials and are available for programs such as Dbase II and Crosstalk.

The training aids available under Concurrent, which offers an interactive concurrency feature, include "How to use the IBM PC XT," "How to use the IBM PC AT," "DOS" and "Advanced Lotus.".

The Expert Series for Dbase III and Dbase III Plus, Wordperfect and Lotus 1-2-3 features guided practices with instructional windows and choice of menu or expert mode as well as the concurrency ability.

Concurrency option

Targeted for novice 1-2-3 users, the Expert Series Training Program uses an optional feature called Concurrency, which allows users to run the training at the same time as the Lotus 1-2-3 program. Concurrency lets users toggle between the training package and the Lotus work sheet without having to restart or lose their place in either program. The program also operates in stand-alone mode.

Concurrency also permits guided practices, which allow the trainee to use 1-2-3 keystrokes, and provides users with the correct input by opening up instructional windows on top of the Lotus screens.

Users are given a choice in accessing the training: menu mode provides menus or lists of training topics; expert mode offers speedy access to any topic in the program through an electronic keyword searching system. In addition, expert mode provides four levels of user experience for each topic.

So, depending on their level of understanding and informational needs, users can access the overview, tutorial, guided practice or reference information components.

As with all Intellisance's training aids, the Expert System for Lotus 1-2-3 training program runs on IBM Personal Computers, Personal Computer XTs and ATs, Personal System/2s and compatibles.

It requires 256K bytes of memory to run in stand-alone mode and 512K bytes of memory to run concurrently with 1-2-3. The software is available in both 5¼-in. and 3½-in. floppy-disk formats and costs $124.95.

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Blue Beat

Continued from page 39

made it big. More than 25,000 people — many wearing suits and power ties — crowded into the Boston Bayside Expo to see what was new and hot with the Macintosh.

From hobby to business

Gone were the days of blue-jean-clad software entrepreneurs showing software for hobbyists. On exhibit at the show were powerful spreadsheets, word processing programs and data base applications.

For its part, Apple anted up with a multitasking operating system that is due for delivery this year, not in the foggy future as IBM and Microsoft have promised with their OS/2 operating system. Apple also rolled out its Hypercard software, a revolutionary product that drew applause even from the normally cynical media at its press introduction.

The show pointed out how glaringly noninnovative IBM has been. The PS/2 line looks unsophisticated, hard to use and boring when compared with the stuff coming from Apple's research and development laboratories.

And it's been a long time since anyone, except, perhaps, dealers with dollar signs dancing in their eyes, cheered an IBM product.

Distinct charter

In his keynote speech at Macworld Expo, Apple's Chief Executive Officer John Sculley pointed out a key distinction between Apple and IBM. Apple, he said, is working to develop products for the individual, while IBM's goal is to produce microcomputers that operate as peripherals to mainframes.

His speech revived what had become an ignored truth about PCs. The microcomputer first appealed to corporate users because of its ability to act alone. Users liked the autonomy and security that the technology presented.

Manufacturers and MIS departments may have forgotten that, but users haven't. They still like the autonomy and freedom a PC represents, which is one reason they're starting to buy the Macintosh.

Can't ignore it

Now MIS departments and information centers are going to have to deal with the Mac. By many estimates, it's the biggest selling personal computer in the country. That means ignoring the Macintosh's impact and presence in offices just won't work anymore.

Third-party companies are working hard to move the Macintosh into MS-DOS-standard corporations. Several vendors have developed devices that allow the Mac to run IBM-standard MS-DOS. AST Research, Inc. in Irvine, Calif., is already shipping one coprocessor board that runs on the Macintosh II. Insignia Solutions, Inc. is selling Soft PC, a software package that allows the Macintosh II to run MS-DOS.

Creative users may already be using the devices to get around company buying restrictions that specify IBM or compatibles.

If a machine runs MS-DOS, it can be called a clone, no matter what manufacturer makes it.

The influx of the Mac into large companies leaves users with a choice among three standards as well as a choice between OS/2 and MS-DOS. That's good news for users but bad news for IBM.

It seems now that while IBM doggedly fought its battle with the clones, it left a major front uncovered. Wily Apple moved in and took ground that IBM didn't even know was up for grabs.

Depke is editor of "IBM Watch," a biweekly newsletter published by IDG Communications, Inc.

Tech Talk

Continued from page 39

Ivory is neither the first nor the only single-chip symbolic processor; Texas Instruments, Inc. produces a similar chip. But unlike TI, Symbolics will be OEMing its product. Russell Noftsker, Symbolics chairman and chief executive officer, says that Ivory will be available on coprocessor boards for other computers in the next 24 months.

This occurrence suggests that the PC of the future may be a dual system. On one side, it would perform traditional computing tasks via an extremely powerful reduced instruction set computing-based processor. On the other, it would run expert systems and do other AI things via an embedded LISP engine.

But are we yet at that ultimate interface — the computer that learns about us as we learn about it?

There are those who suggest we are not. Those revisionists that mourned the hyping of AI are also questioning whether AI is the technology that you want to perform interface tasks. This group suggests that although AI mimics well what people do when they reason, humans do not relate to one another according to the dictates of reason or logic. Rather, people use a complex series of behaviors that are associative, nonrational, emotive and, frequently, subconscious.

Revisionists then suggest that if we are ever to produce machines that can interact with us, we must develop technologies that are capable of reproducing irrational behaviors or, at least, of understanding these actions.

This view was perhaps best brought out in a recent paper titled "Experiences with a Feeling-Thinking Machine," presented at the 1987 International Conference on Neural Networking in San Diego by Mark Johnson and Raymond Scanlon, both with the U.S. Army's Armament Research and Development Center in Watervliet, N.Y.

In it the authors write: "We have set out to design and construct a series of feeling-thinking machines. 'Feeling' because there is no meaningful motor activity without motivation. 'Thinking' because that is what makes the interaction interesting. Our end goal is to construct a machine that thinks and acts like a man. Therefore, our machines will not think rationally but rather irrationally and with emotion."

To this end, they describe Pacrat, a software creature that exists in a simulated world constrained to the screen of a PC. Pacrat has a home, which he leaves only when stimulated by feelings such as hunger and boredom. Once in the wild world of the screen he searches for simulated food even though he is constantly under the lash of artificial agoraphobia. Outside the protection of his home, Pacrat lives in constant dread, perhaps of some predator and, therefore, flees to his hole the minute he has eaten. If he cannot find food, he feels anger and frustration.

Pacrat's behavior appears simple, but the software and technology underlying it most certainly is not. His brain includes simulations of a mammalian cortex and hypothalamus. He is, in fact, an example of the emerging science of neural networking, which attempts to reproduce the behavior of the human brain by reproducing its structure either physically in radically new hardware or by simulation in software.

> **"Our end goal is to construct a machine that thinks and acts like a man."**
>
> MARK JOHNSON, RAY SCANLON
> ARMAMENT RESEARCH AND DEVELOPMENT CENTER

Few of us would care to have Pacrat scrambling about our spreadsheets. And his emotions — fear, hunger, boredom — are hardly the sort of thing we want in our machines. But, perhaps, he points the way to the ultimate end-user interface. Even if we don't want our machines to become frightened or angry, it would be nice if we could at least make them understand why we become that way and how to comfort us accordingly.

Tucker is *Computerworld Focus*'s features editor.

Vendors in the hot seat

Focus's Hot Seat column consists of product- and service-related questions that you, our readers, would like us to ask a particular vendor. We'll print the questions and answers we deem of greatest interest to our readership.

Call us, toll free, at 1-800-343-6474 if you have a question. Or, forward your inquiries to Lory Zottola, Managing Editor, *Computerworld Focus*, 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

You'll never know unless you ask.

Mac tools

Continued from page 39

from a Lotus Development Corp. 1-2-3 spreadsheet and pasted it into a Macintosh word processor.

Multifinder will be bundled, at no charge, with every Mac sold after September. Current Mac users can upgrade to the product for $49.

Hypercard, meanwhile, is a software package with no direct analogy in the IBM world.

Essentially, it is a data management system that stores information in the form of cards, or files, which take as their model the standard paper index card.

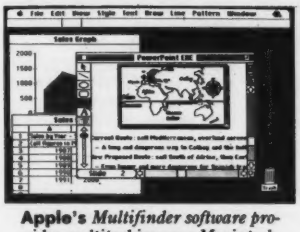
A user may store text and pictures on a card, and cards may be associated by a number of unusual methods.

For example, one application shown at the debut was a collection of clip art drawings. Each drawing was contained on a single card. Individual parts of each drawing were then associated with other drawings on other cards via special software connections.

In the demonstration application, the developer had decided to link different drawings by the theme of "eye." Clicking the mouse button directly over the eye of a fish, for example, caused a card showing the eye of man to fill the screen instantly.

Hypercard seems to be the path Apple is taking to overcome the infamous software shortage for the Mac.

Not only is Hypercard extremely accessible to professional software developers, it also comes complete with a number of application development tools that allow nontechnical end users to put together their own stackware — the term Apple uses for Hypercard-based applications.



Apple's *Multifinder software provides multitasking on a Macintosh.*

Like Multifinder, Hypercard will be bundled for free with future sales of the Mac products. Existing Mac users may purchase the program for $49.

The significance of the announcements is that the products are part of Apple's continuing efforts to gain entry into corporate America.

In effect, Apple is demonstrating that it has the multitasking and executive information system technology now that the IBM Personal System/2 has only promised to deliver in the future. And, as Apple staff missed no chance to point out, Apple is willing to give away that technology whereas IBM's solution is likely to be expensive.

It may be that Apple sees a window of opportunity following the PS/2 introduction.

With MIS officers already considering a major shift in the personal computer standard from the IBM Personal Computer to the PS/2, Apple can present itself as an alternative route to end-user computing. — MICHAEL TUCKER

Circle Reader Service Number 160

PRODUCT CHECKLIST

IBM has introduced two members of its Personal System/2 line of microcomputers, the **Model 25** and the **Model 80-311.**

The PS/2 Model 25 has an 8-MHz Intel Corp. 8086 processor with 512K bytes of main memory, expandable to 640K bytes. The Model 25 also features two 720K-byte, 3½-in. diskette drives and the IBM PS/2 Collegiate Kit, which contains IBM PC-DOS 3.3, Microsoft Corp. Windows 1.04, four blank 3½-in. diskettes and a tutorial diskette.

IBM claimed the Model 25 is 40% smaller than the IBM Personal Computer and more than twice as fast.

The PS/2 Model 80-311 features a 20-MHz Intel 80386 processor with 2M bytes of main memory, expandable to 4M bytes; a 1.44M-byte, 3½-in. diskette drive with an optional 3½-in. diskette drive available; 314M-byte, 5¼-in. fixed-disk drive with an optional 5¼-in. drive available; built-in IBM Video Graphics Array; IBM Micro Channel bus architecture with 32-bit data path; and 128K bytes of read-only memory containing power-on self-test of system components. IBM added that an optional Intel 80387 math coprocessor is also available.

The PS/2 Model 25 is priced at $1,350 with monochrome display and $1,695 for a color display system.

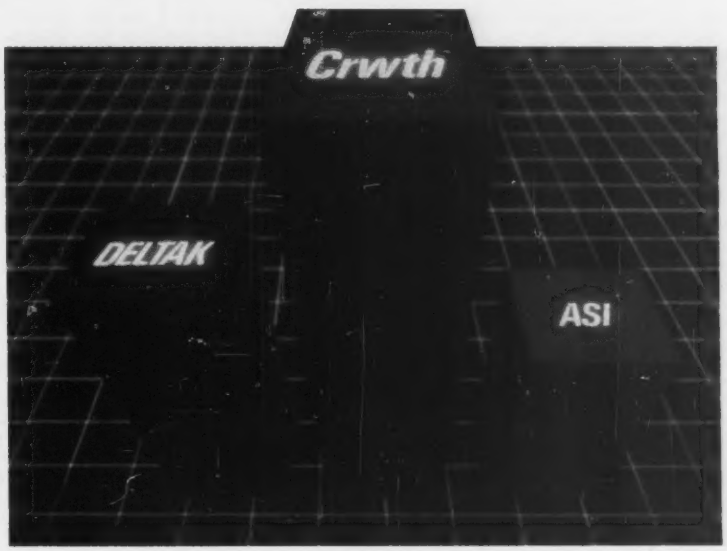
The Intel 80386 Model 80-311 costs $13,995, and the 314M-byte fixed disk drive option costs an extra $6,495.

IBM, Information Systems Group, 900 King St., Rye Brook, N.Y. 10573.

Circle Reader Service Number 161

Lotus Development Corp. has introduced a 3½-in. disk version of **Lotus HAL** for the IBM Personal System/2 that takes advantage of the features of IBM PC-DOS 3.3 and Microsoft Corp. MS-DOS, new data storage devices and the PS/2's video displays.

Continued on page 42



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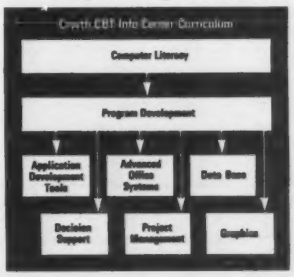

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PRODUCTS

Unisys unveils A series systems, aggressive pricing strategy

Unisys Corp., based in Blue Bell, Pa., said it is hoping that three recently introduced entry-level departmental systems will clarify the confusion surrounding the firm's product direction since its creation from the merger of Burroughs Corp. and Sperry Corp.

Unisys said it is aiming its three systems — the A 1, A 4 and A 6 — at IBM's 9370 and System/36 and Digital Equipment Corp.'s VAX series of departmental computers.

Ranging from $25,000 to $145,000, the three models are upgrades to existing Burroughs B1000, B5000 and B6000 lines of departmental systems. To make the products more savory to users, the new A series machines run the same operating system as the current A series systems as well as software applications written in Linc, a fourth-generation language from Unisys. Upward compatibility is, therefore, assured.

Unisys has been wooing value-added resellers to help launch an aggressive pricing policy called the Solution Partner, in which Unisys system hardware, operating system, services and support are bundled into turnkey client solutions.

As an example of its pricing policy, Unisys said that a bundled Solution Partner manufacturing system, consisting of the Unisys A 1 machine and Unisys BAMCS software, will be priced at $128,500.

According to Unisys, an equivalent bundled system that uses an IBM System/38 Model 100 and Mapics II software would run about $174,000, while a Digital Equipment Corp. Microvax II bundled with Maxcim software reportedly would cost more than $168,000.

Grab new business

With predatory pricing and systems compatibility, Unisys spokesmen said they hope to keep existing Burroughs customers happy and also grab new business that might otherwise go to IBM or DEC.

"We want to consolidate our existing [Burroughs] user base and go after new markets," explained Doug Morgan, program marketing manager for mainframe systems at Unisys. "We're not sitting back and waiting."

The new entry-level A systems pack 12M bytes of random-access memory, expandable to 48M bytes. Separate peripheral processors control system peripherals, which can be increased through the use of two expansion cabinets.

But where does the existing Sperry line of equipment fit in? Morgan said current Unix-based Sperry Mapper personal computers can be tied into the systems through available software. As for the line of bigger Sperry departmental computer systems, however, Morgan claimed the Unix-based machines will essentially remain separate because they serve a different market than the A series.

Following this reasoning, Unisys could be splitting its systems and marketing push down the middle, based on traditional Burroughs and Sperry strong points. If that is true, then it follows that Sperry systems and marketing will be predominantly aimed at the government and military, while the A series and future Burroughs/A series upgrades will be joining other Burroughs machines in such vertical markets as finance and retail.

"If a customer tells our A series salesmen that he wants a Unix machine," Morgan said, "we'll say 'fine,' and bring in one of our Sperry specialists. If a customer decides the A series is more appropriate than Unix, we'll bring in a Burroughs specialist." — STAN KOLODZIEJ

Circle Reader Service Number 162

Checklist

Continued from page 41

Lotus HAL is a collection of shortcuts that simplify Lotus 1-2-3 tasks such as entering formulas, formatting worksheets, moving and copying data and sorting data bases.

Lotus also announced that current Lotus HAL users will be able to exchange their 5¼-in. disk version for the 3½-in. version. The exchange program will begin in the fourth quarter of this year and will carry a $30 shipping and handling fee.

Lotus HAL is available immediately and retails for $150.

Lotus, 55 Cambridge Pkwy., Cambridge, Mass. 02142.

Circle Reader Service Number 163

Britton Lee, Inc. has introduced the **BL8000 Shared Data Base System**, a relational data base management system combining parallel processing and a reduced instruction set computer architecture.

The BL8000 runs the relational DBMS in a dedicated Britton Lee processor designed for data base management. The application runs on the host mainframe, and the DBMS runs on the BL8000. The system will initially be available in three models: the 400, 420 and 460. Disk storage ranges from 1G byte to 120G bytes, and main memory ranges from 16M bytes to 256M bytes.

Britton Lee said the BL8000 will support IBM VM/CMS and PC-DOS operating systems, Digital Equipment Corp.'s VAX/VMS operating systems, Apollo Computer, Inc. and Sun Microsystem, Inc. workstations and AT&T's Unix System V operating system.

The BL8000, with 1G byte of formatted disk storage and 16M bytes of random-access memory, is $320,000.

Britton Lee, 14600 Winchester Blvd., Los Gatos, Calif. 95030.

Circle Reader Service Number 164

Tracer: The Spreadsheet Detective, an interactive, memory-resident program that aids in the detection and correction of errors in spreadsheet formulas, has debuted from **The Mt. Whitney Group.**

Mt. Whitney Group's *Tracer*

The company said Tracer tests for several types of potential errors including circular references, the use of text in computations, reversed ranges, perimeter cells omitted from ranges and references to blank cells. Tracer discloses all error locations, the company claimed, and corrections can be made easier with a trace feature.

Tracer is compatible with spreadsheets created with Lotus Development Corp. 1-2-3, Releases 1A and 2, and Computer Associates International, Inc.'s Supercalc 3 and 4.

Tracer: The Spreadsheet Detective costs $89.95.

The Mt. Whitney Group, Building G19, 11612 Knott Ave., Garden Grove, Calif. 92641.

Circle Reader Service Number 165

Nantucket Corp. has rolled out **Mcmax**, a relational data base management system.

The product is reportedly compatible with Ashton-Tate Dbase for the Apple Computer, Inc. Macintosh computer Models 512E, Plus, XL, SE and II.

The package, which includes a Dbase-compatible programming language, uses the same program and data files on both Macintosh and IBM Personal Computers as well as compatibles. Users can transfer files by using serial connections and communications software.

Mcmax is priced at $295.

Nantucket, Suite 300, 12555 W. Jefferson Blvd., Los Angeles Calif. 90066.

Circle Reader Service Number 166

OA Technologies, Inc. has announced **Version 2.0** of its **Oatmail** personal computer gateway to Digital Equipment Corp.'s Vaxmail and All-In-1 office automation systems.

The product allows PC users to create, send and receive All-In-1 mail and Vaxmail. It features a window-driven user interface, multiple host access, wild-card transfers, support for many data communications front ends and support for DEC's Ethernet LAT protocol.

The vendor said Oatmail provides automated mail pickups, delivery and file-transfer capabilities. It also offers DEC VT220 terminal emulation and a choice of transfer protocols. Oatmail Version 2.0 costs $300.

OA Technologies, 10001 Craig Road, St. Louis, Mo. 63146.

Circle Reader Service Number 167

Firesign Computer Co. has unveiled **Outbound**, a software link designed for IBM MVS users who need to transfer files to unattended personal computers.

The product is said to send commands over an IBM System Network Architecture network to a microcomputer with a standard IBM 3270 emulation card. PC-resident Outbound software then decodes the command and reads or writes the specified file.

A perpetual license for one MVS host and an unlimited number of personal computers costs $24,000.

Firesign, 480 Green St., San Francisco, Calif. 94133.

Circle Reader Service Number 168

Xerox Corp. has announced the **Memorywriter 6016 and Memorywriter 6018** mid-range electronic typewriters.

According to Xerox, the 6018 has entry-level text-editing capabilities and is intended for applications in which users make revisions to documents that are typically one to three pages in length. It has 32K bytes of random-access memory, is capable of storing approximately 16 pages of text and enables 6018 users to edit text before the information is printed.

The Xerox 6016 Memorywriter has 8K bytes of random-access memory that enables users to save formats and commonly used phrases such as names, headings and lists.

Xerox's *Memorywriter 6018*

Both machines include auto paper insertion, delayed print and a spelling checker that uses a 50,000-word dictionary. Also available is a communications interface module that enables the 6016 and 6018 to be used as letter-quality printers for most personal computers equipped with Centronics Data Computer Corp.-type parallel or RS-232C serial interfaces.

The Xerox 6016 Memorywriter costs $895; the Xerox 6018 Memorywriter costs $1,045.

Xerox, P.O. Box 1600, Stamford, Conn. 06904.

Circle Reader Service Number 169

Pacer Software, Inc.'s PClink software package now provides Apple Computer, Inc. Macintosh and IBM Personal Computer to Digital Equipment Corp. VAX integration over Ethernet.

The product includes features for moving data between the Microsoft Corp. MS-DOS and Macintosh environments. In addition, PClink provides terminal emulation of DEC VT100, VT200 and VT241; virtual disks; bidirectional file transfer of ASCII and binary files at rates up to and above 800K bit/sec.; and remote printer access.

PClink pricing is server based and starts at $2,000 per VAX.

Pacer Software, Suite 402, 7911 Herschel Ave., La Jolla, Calif. 92037.

Circle Reader Service Number 170

Network Systems Corp. has announced its **User-Access** interactive software program, which reportedly allows users of the vendor's Hyperchannel network to connect to other computers on the network.

The software provides batch and interactive communications functions among both similar and different computers and operating systems.

Functions of User-Access include interactive file transfer, remote command execution and remote job submission. User-Access starts at $8,000.

Network Systems, 7600 Boone Ave. N., Minneapolis, Minn. 55428.

Circle Reader Service Number 171

CALENDAR

Oct. 11-17

2nd Annual PC Expo. Chicago, Oct. 13-15 — Contact: Jim Mion, PC Expo, 333 Sylvan Ave., Englewood Cliffs, N.J. 07632.

System/3X Users Exposition and Conference. Atlanta, Oct. 14-15 — Contact: Nancy Smith, The Producers, 360 Merrimack St., Lawrence, Mass. 01843.

Managing the Strategic Data Planning Project. Andover, Mass., Oct. 14-16 — Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810.

Oct. 18-24

Systems Integration: The Business Challenge. Scottsdale, Ariz., Oct. 18-21 — Contact: Marji Grubic, International Data Corp., 5 Speen St., Framingham, Mass. 01701.

Fourth Annual Nomad Users' Conference. New Orleans, Oct. 18-22 — Contact: Christine Palomaa, Must Software International, 187 Danbury Road, Wilton, Conn. 06897.

Data Communications: Basic Concepts. San Francisco, Oct. 19-20 — Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521. Also being held Oct. 26-27 in Washington, D.C.

Hammer Forum '87. Cambridge, Mass., Oct. 19-21 — Contact: Hammer and Co., Five Cambridge Center, Cambridge, Mass. 02142.

The 1987 North American Data General Users Group Conference. Las Vegas, Oct. 19-22 — Contact: The North American Data General Users Group, 3400 Computer Drive, Westboro, Mass. 01580.

Data Communications II: Systems and Applications. San Francisco, Oct. 20-22 — Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521. Also being held Oct. 28-29 in Washington, D.C.

Magnetic and Optical Disk Storage Seminar and Tape Storage Forum. San Jose, Calif., Oct. 20-22 — Contact: Technology Forums, P.O. Box 1729, Minnetonka, Minn. 55345.

Oct. 25-31

1987 Fall Joint Computer Conference. Dallas, Oct. 25-29 — Contact: FJCC '87, Infomart, 1950 Stemmons Freeway, #6038, Dallas, Texas 75207.

Local-Area Networks. Boston, Oct. 26-27 — Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

The VAX Business User Forum. New York, Oct. 26-28 — Contact: IDG Conference Management Group, P.O. Box 9171, Framingham, Mass. 01701.

Unix Expo, The Unix Operating System Exposition and Conference. New York, Oct. 27-29 — Contact: National Expositions Co., 49 W. 38th St., New York, N.Y. 10018.

Computer-Aided Software Engineering Symposium. San Francisco, Oct. 27-29 — Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810.

ISDN: Concepts and Applications. Boston, Oct. 28-29 — Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Third Annual Technology Opportunity Conference on Small Systems. Millbrae, Calif., Oct. 28-30 — Contact: Judith Hanson, Rothchild Consultants, 256 Laguna Honda Blvd., San Francisco, Calif. 94116.

Advanced LANs: Connectivity and Network Management Issues. Atlanta, Oct. 28-30 — Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810.

Nov. 1-7

The 36th Annual Data Processing Management Association Computer Conference and Business Exposition. San Francisco, Nov. 2-4 — Contact: DPMA San Francisco '87, DPMA Headquarters, 505 Busse Highway, Park Ridge, Ill. 60068.

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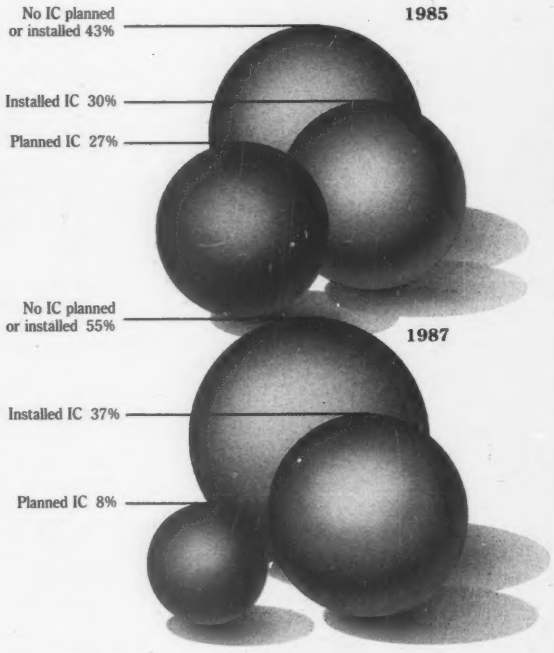
A maturing market

Information center (IC) distribution in U.S. IBM/ plug-compatible mainframe sites, 1985 and 1987



INFORMATION GATHERED FROM 680 RESPONDENTS TO A COMPUTER INTELLIGENCE INFO CENTER SURVEY OF 11,000 IBM/PLUG-COMPATIBLE MAINFRAME SITES.

GRAPHIC BY BRUCE SANDERS

OF INTEREST

"It often seems that information centers can't do anything wrong, and MIS can't do anything right. MIS is often put in the position of bully by the press. I guess it's the underdog syndrome."

JOHN PLUNKETT
VIRGINIA POWER

See story page 13

next issue

November's *Computerworld Focus* on personal computers looks at changing technologies. Are PCs replacing mainframes? Why go with an IBM Personal System/2? How effective are PC users groups? Get the lowdown on these and other topics, including hypertext, laptops, cooperative processing and microcomputer exotica. Also, our Special Section will spotlight what some of the big-name vendors are offering in terms of connectivity. Don't miss it!

Bombast blaster

Thomas Roberts

Bold pronouncements have been made recently by industry savants about the declining influence and even the imminent demise of corporate information centers.

Corporate information centers have traditionally been bastions of mainframe and minicomputer power. But forward thinkers have examined the case and returned a verdict: The price and performance advantages and flexibility of personal computers and local-area networks (LAN) will soon make centralized information processing obsolete. This kind of bombast undoubtedly sells a lot of magazines, but it is not worth much more than the ink on the page.

THE INSIDER

Whenever I've asked MIS professionals what they think of the impending doom facing information centers, my question has been met with a smirk. If they thought I was serious, they probably also thought I was crazy and immediately lost any respect they held for me. That is the appropriate response to this type of question for several reasons.

First, PC and LAN technologies have a long way to go before their capabilities rival those of almost any system found in even a backwater info center. The most apparent problem is still horsepower. Intel Corp. likes to claim that a system built on its 80386 microprocessor packs 3 million to 4 million instructions per second (MIPS) of processing power. That power puts a 386-based PC roughly in the range of a Digital Equipment Corp. VAX 8530 or an IBM 4381 Model 13. But it is essential to understand that these are systems designed to perform two very different tasks. Multiuser MIPS and single-user MIPS are just not the same, and using the same benchmark to compare the two is virtually meaningless.

Operating systems and applications software running on PC LANs also need significant improvements. Granted, LAN operating systems software is becoming steadily more reliable and capable. With the advent of IBM's OS/2, we can expect more progress in LAN operating systems and multiuser LAN data bases. But these improvements will have to be revolutionary before PC LAN technology can be considered even remotely as reliable as centralized processing.

However, the most compelling reason why information centers are not on the way out is perhaps a political one. It is staggering to think of the billions of dollars invested in hardware, software, manpower and training that currently stock corporate info centers.

To believe this kind of massive commitment will be abandoned in any short order is ludicrous. Even during the next decade, the number of programmers and MIS professionals with mainframe and minicomputer experience will far outnumber those with PC expertise. All those large systems devotees hold a lot of sway and, chances are, most will opt to keep their jobs by prolonging the reign of mainframes and minis for as long as possible.

Roberts is a New York-based independent consultant and writer.

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IBM declared 1987 to be the Year of the Customer. But does the Customer agree? Changes and promises were made. Which promises were kept—and which changes were to the benefit of the customer?

MIS/DP and other information systems professionals will find out November 18 when *Computerworld Extra* publishes a report card for Big Blue. And this special issue will put you in touch with these professionals. Planned topics include:

- **IBM's Systems Applications Architecture** (SAA), which promised to address IBM's own compatibility problems. When and how will it be incorporated into products *and* the information systems environment?
- **PS/2 and OS/2:** Their current state (and problems) have been well documented, but what will they grow into—and has IBM truly responded to customer needs with this combination?
- **IBM's newly created Applications Systems Division,** which seeks to (among other goals) aid non-IBM software vendors as they develop applications. How far along is it, and what is the expected effect on the market?
- **The products released in the Year of the Customer:** How did they fare, and when will the next products become available? Which are in the distant future—and which don't have a future?

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